ALPI-00601

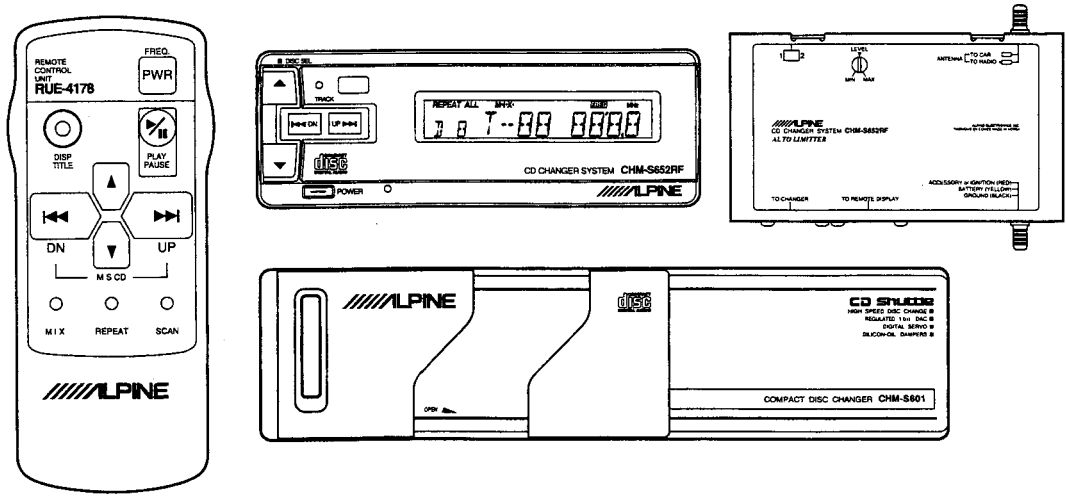
ALPINE
SERVICE MANUAL

Compact Disc Remote Changer System

CD Shuttle

COMPACT disc DIGITAL AUDIO

- This model is component system unit of changer unit and remote display/FM modulator unit.
- The changer unit described in this manual is developed from 5960.
  For information that is not mentioned in this service manual, refer to the Service Manual • 5960 (68P61020W02).
- For the CD deck mechanism parts (DT24A010) of this model, refer to the Service Manual • DT Series (68P61023W01).
- 当モデルは、チェンジャーユニットとリモートディスプレイ／FMモジュレーターユニットとのコンポーネントシステム製品です。
- チェンジャーユニットについては、5960がベースとなっております。このマニュアルは相違点のみを記載しておりますので、詳細については、サービスマニュアル・5960 (68P61020W02)を参照願います。
- 本機のCDメカニズム (DT24A010) についての資料は、サービスマニュアル・DTシリーズ (68P61023W01)を参照願います。



CHM-S652RF

Contents

Packing Assembly Parts List 3
Packing Method View 3

●Changer Unit

Contents 4
Parts Layout on P.C. Boards and Wiring Diagram ..... 5 to 6
Exploded View (Cabinet) ..... 7 to 8
Electrical Parts List (Only Difference) 9
Cabinet Assembly Parts List (Only Difference) 9

Specifications
Servo Monitor
Description of IC Terminal
Block Diagram
Schematic Diagram
Semi-Conductor Lead Identifications

Refer to the Service Manual • 5960 (Part No. 68P61020W02).
サービスマニュアル・5960 (68P61020W02) を参照願います。

●Remote Display Unit/FM Modulator Unit

Contents 10
Specifications 11
Adjustment Procedures 12
Description of IC Terminal ..... 13 to 14
Block Diagram 15
Parts Layout on P.C. Boards and Wiring Diagram (1/2) ..... 17 to 18
Parts Layout on P.C. Boards and Wiring Diagram (2/2) ..... 19 to 20
Schematic Diagram ..... 21 to 23
Electrical Parts List ..... 24 to 28
Exploded View (Cabinet) ..... 29 to 30
Cabinet Assembly Parts List 31
Semi-Conductor Lead Identifications 32

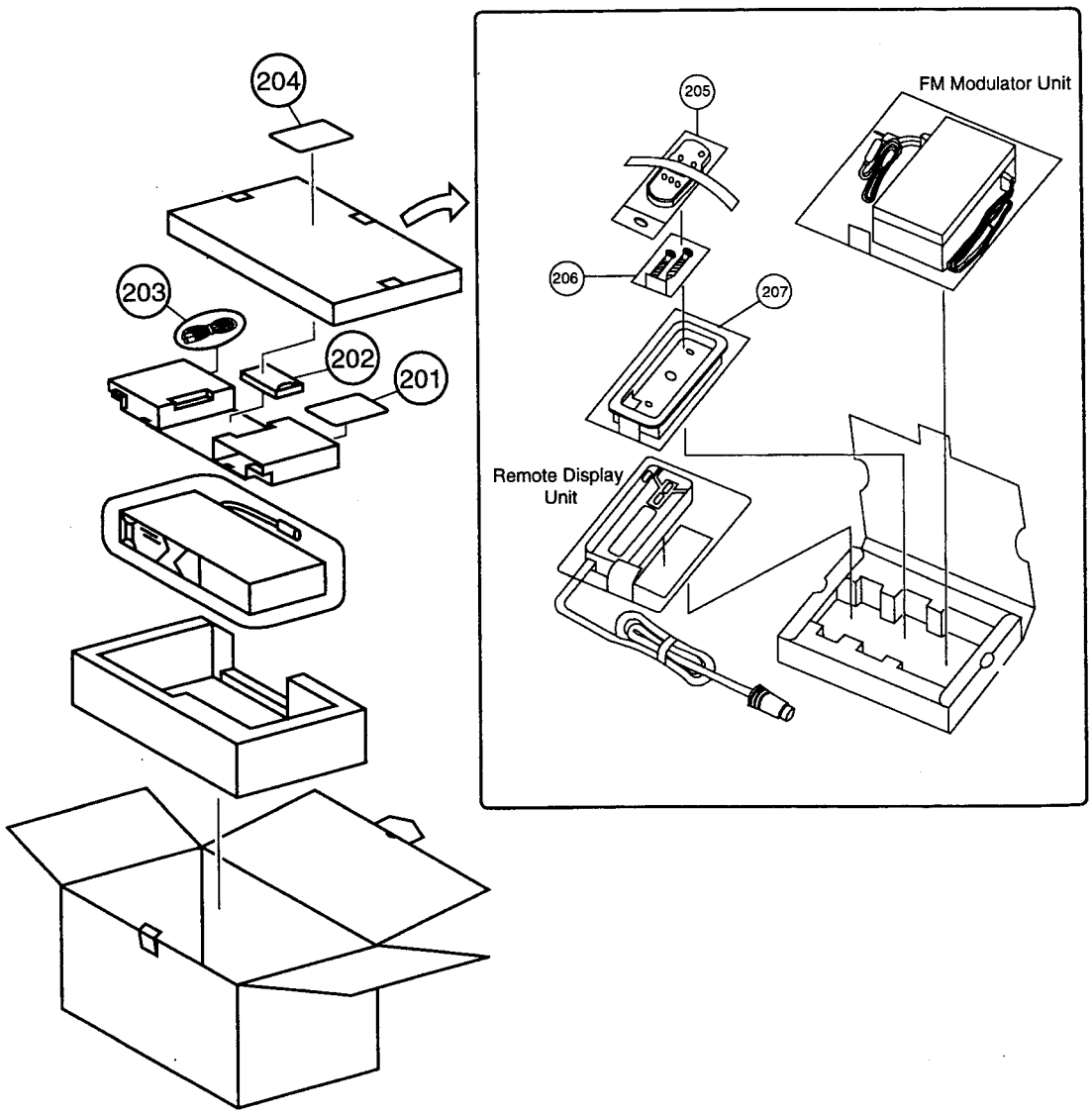
Packing Assembly Parts List

Symbol No.		Part No.	Description
○	201	01V91200W89	Assy., Kit Installation
△	201	01C71646W01	Assy., Kit Installation
□	201	01V91200W90	Assy., Kit Installation
	202	01D00560K01	Assy., Magazine
	203	01T45225W08	Assy., DIN Connector
	or	01T45150W03	Assy., DIN Connector
	or	01T45225W16	Assy., DIN Connector
○	204-1	68P90664W25	Owner's Manual

Symbol No.		Part No.	Description
△	204-1	68P90579W34	Owner's Manual
□	204-1	68P90579W37	Owner's Manual
	204-2	15A71395W01	Cover, Plate L/R
	205	01T75235W08	Assy., Card Remocon
	206	03E25256S01	Screw, Tapping (M2.9X20)
	207	15E25257S01	Case, Flash Mount

NOTE: ○: For North American Model Only, △: For General Foreigh Model Only,
□: For Japanese Model Only, Others: Common.

Packing Method View



Changer Unit

Contents

Parts Layout on P.C. Boards and Wiring Diagram ..... 5 to 6
Exploded View (Cabinet) ..... 7 to 8
Electrical Parts List (Only Difference) 9
Cabinet Assembly Parts List (Only Difference) 9

Parts Layout on P.C. Boards and Wiring Diagram

All P.C. Boards viewed from soldered side.

1

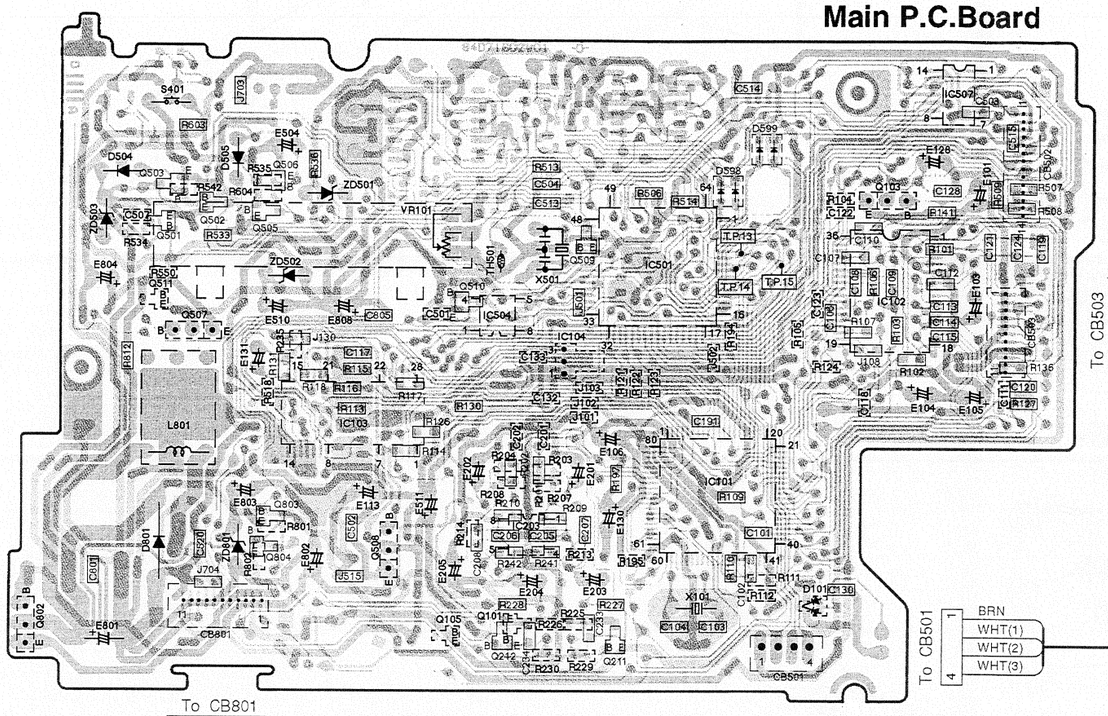
2

3

4

5

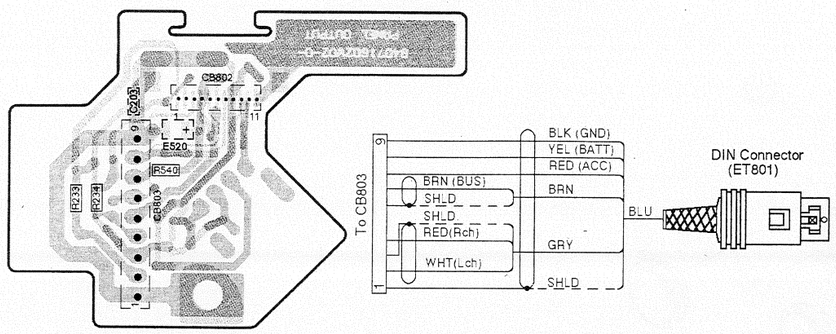
Main P.C.Board



To CB801

To CB802

Connector P.C.Board

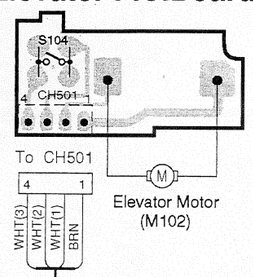


To CB503

To CB501

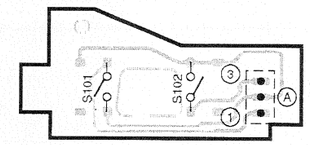
BRN
WHT(1)
WHT(2)
WHT(3)

Elevator P.C.Board

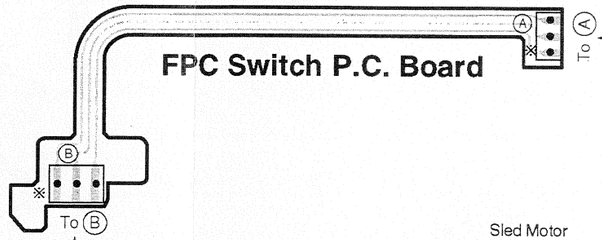


Pick-Up Unit (HD101)

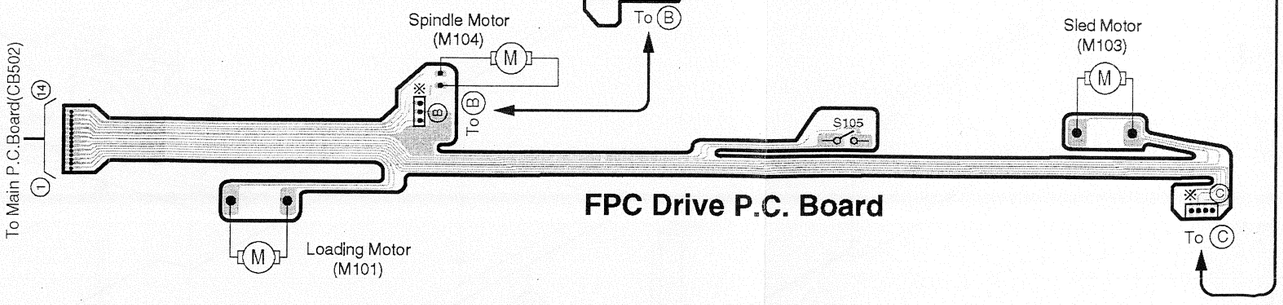
Swich P.C.Board



FPC Switch P.C. Board



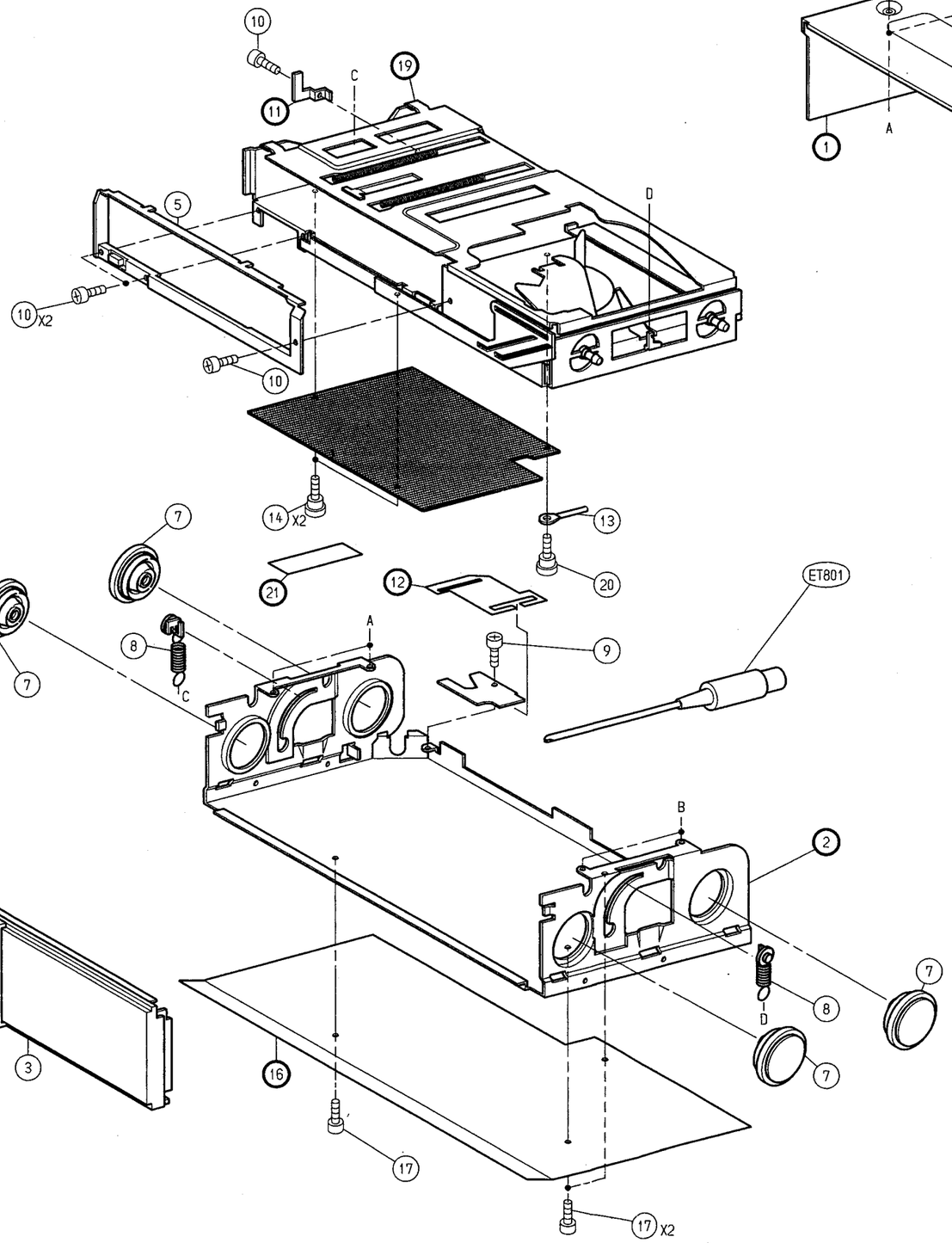
FPC Drive P.C. Board

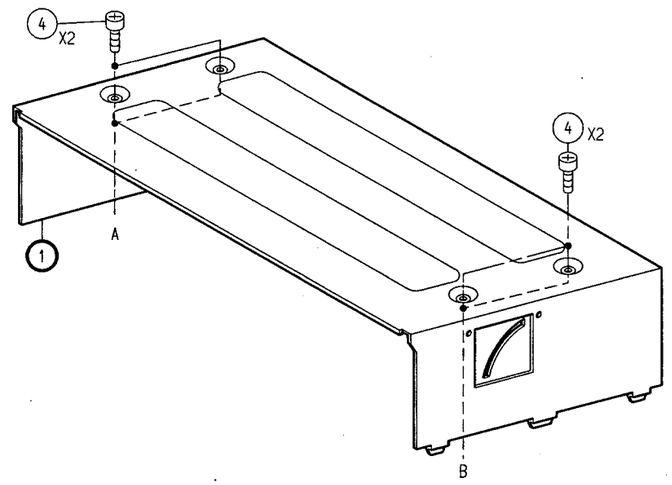


Orange Color Pattern : Component Side Pattern
Blue Color Pattern : Foil Side Pattern

A | B -5- | C | D | E | F -6- | G

Exploded View (Cabinet)





Electrical Parts List

● Changer Unit

NOTE: For the parts not mentioned, refer to the Service Manual for 5960 (Part No. 68P61020W02).

Symbol No.	Part No.	Description
Main P.C.Board		
IC's		
IC102	51T65510W01	AN8806SB
IC104	51T11054W02	NJM78L05UA
IC501	51T65062W03	65062W03
Diodes		
D598	48T81063F01	CP., MA159
D599	48T81063F01	CP., MA159
Capacitors		
E101	23T55402W13	ELY., 100µF / 10V
C201	08S65128F39	CP., 150pF
E201	23T55402W15	ELY., 10µF / 16V
C202	08S65128F39	CP., 150pF
E202	23T55402W15	ELY., 10µF / 16V
C233	08S65128F62	CP., 2700pF
C234	08S65128F62	CP., 2700pF
E510	23S61523F06	ELY., 33µF / 6.3V
C801	08T15399W03	CP., 0.047µF
E801	23T75427W01	ELY., 470µF / 16V
E803	23S61523F14	ELY., 33µF / 16V
E804	23T55402W18	ELY., 47µF / 16V

Symbol No.	Part No.	Description
Resistors		(All resistors are chip 1/10W±5% unless otherwise noted.)
R126	06S64995F81	15K ohm
R141	06S70072F15	27 ohm 1/4W
R201	06S64995F72	6.2K ohm
R202	06S64995F72	6.2K ohm
R203	06S64995F82	16K ohm
R204	06S64995F82	16K ohm
R207	06S64995F61	2.2K ohm
R208	06S64995F61	2.2K ohm
R241	06S64996F11	240K ohm
R242	06S64996F11	240K ohm
R519	06S64995F77	10K ohm
Connector P.C.Board		
Capacitors		
C203	08S65128F56	CP., 820pF
E520	23T25191W24	CP., ELY. 0.1µF / 50V
Miscellaneous		
ET801	01T65051W01	DIN Connector
or	01T65051W06	DIN Connector
M104	01V83900W16	Assy., Motor Spindle 2V-90mA (SPINDLE)

Cabinet Assembly Parts List

● Changer Unit

NOTE: For the parts not mentioned, refer to the Service Manual for 5960 (Part No. 68P61020W02).

Symbol No.	Index	Part No.	Description
3	5-B	13C71137W04	Assy., Front Escutcheon
4		03A61184W03	Screw, Bind (M2.6×4)

Symbol No.	Index	Part No.	Description
5	2-C	64C60211W01	Assy., Plate Inner
20	3-D	03A38056W02	Screw, Special (M2.6×6)

Remote Display Unit/FM Modulator Unit

Contents

Specifications 11
Adjustment Procedures 12
Description of IC Terminal ..... 13 to 14
Block Diagram 15
Parts Layout on P.C. Boards and Wiring Diagram (1/2) ..... 17 to 18
Parts Layout on P.C. Boards and Wiring Diagram (2/2) ..... 19 to 20
Schematic Diagram ..... 21 to 23
Electrical Parts List ..... 24 to 28
Exploded View (Cabinet) ..... 29 to 30
Cabinet Assembly Parts List 31
Semi-Conductor Lead Identifications 32

Specifications

RF Output Frequency	87.7~89.9MHz
RF Output Level / Impedance	70±6dBμ / 75 ohm
Modulation Sensitivity (850mV IN, LEVEL MAX.)	4±3dB
Power Supply	14.4V DC
Semiconductors	Remote Display Unit : 3IC's, 13Transistors, 4Diodes, 2Zener Diodes
	FM Modulator Unit : 4IC's, 20Transistors, 10Diodes, 5Zener Diodes
Dimensions (W×H×D)	Remote Display Unit : 113×39.5×19mm
	FM Modulator Unit : 130×35×74mm
Weight	Remote Display Unit : 0.18kg
	FM Modulator Unit : 0.4kg

NOTE : Due to Continuing product improvement, specifications and designs are subject to change without notice.

Adjustment Procedures

Phase Adjustment

1. Connection

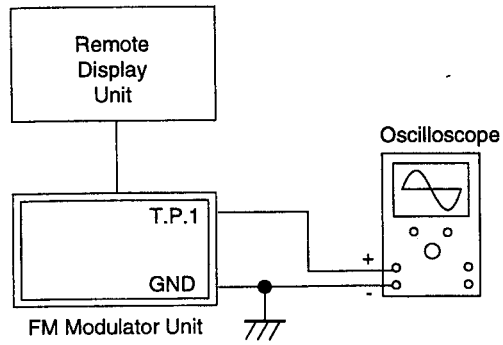


Figure 1
<1図>

2. Power Supply ..... DC 14V
3. Control Settings
   Frequency Setting Mode ..... ON (88.7MHz)
4. Adjustment Procedures
   Adjust VR001 so that the point "A" on the waveform at T.P.1 becomes flat as shown in Figure 2.

   T.P.1の波形のポイント "A" の部分が平らになる様（2図）VR001 で調整します。

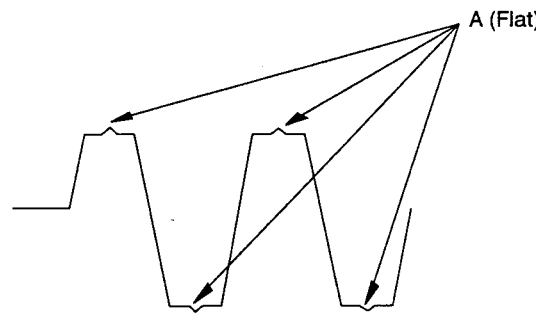


Figure 2
<2図>

NOTE : For the Adjustment parts and Test Point, refer to the Parts Layout on P.C. Boards and Wiring Diagram.

注記：調整部品及びテスト・ポイントの詳細については、「Parts Layout on P.C. Boards and Wiring Diagram」を参照願います。

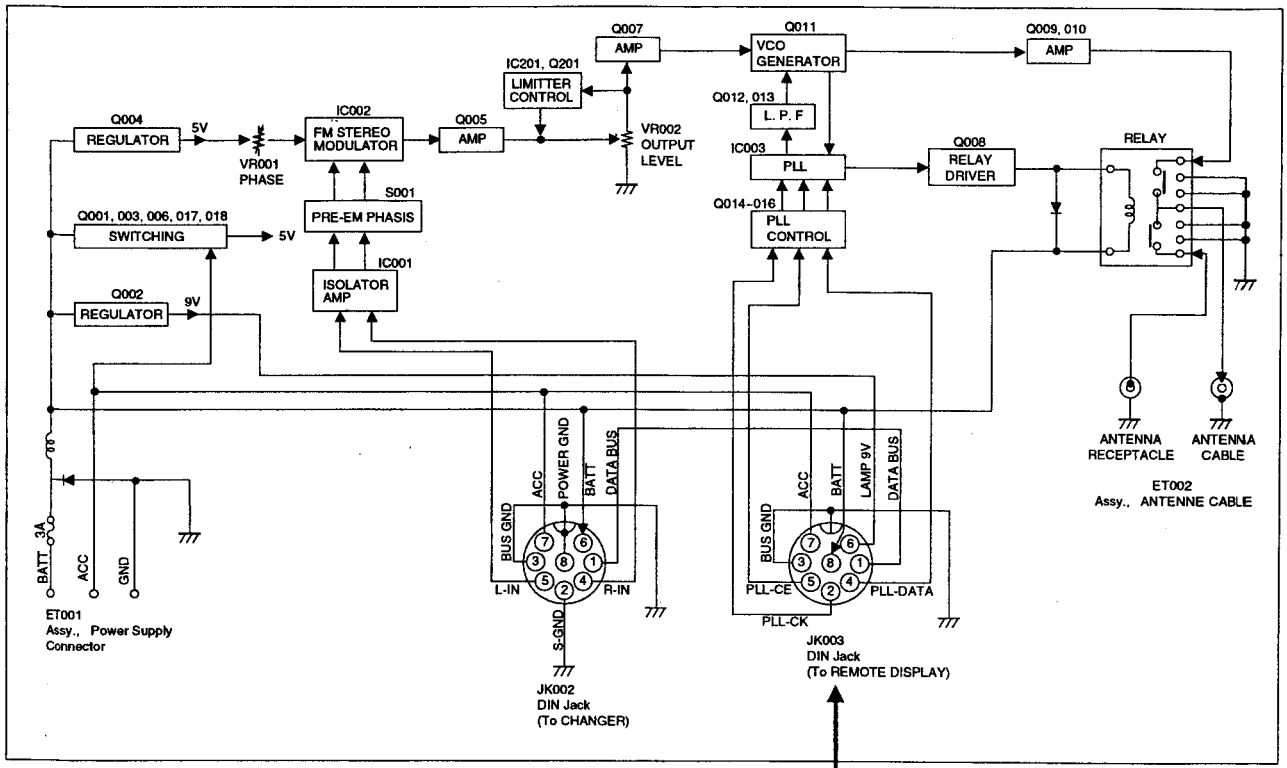
Description of IC Terminal

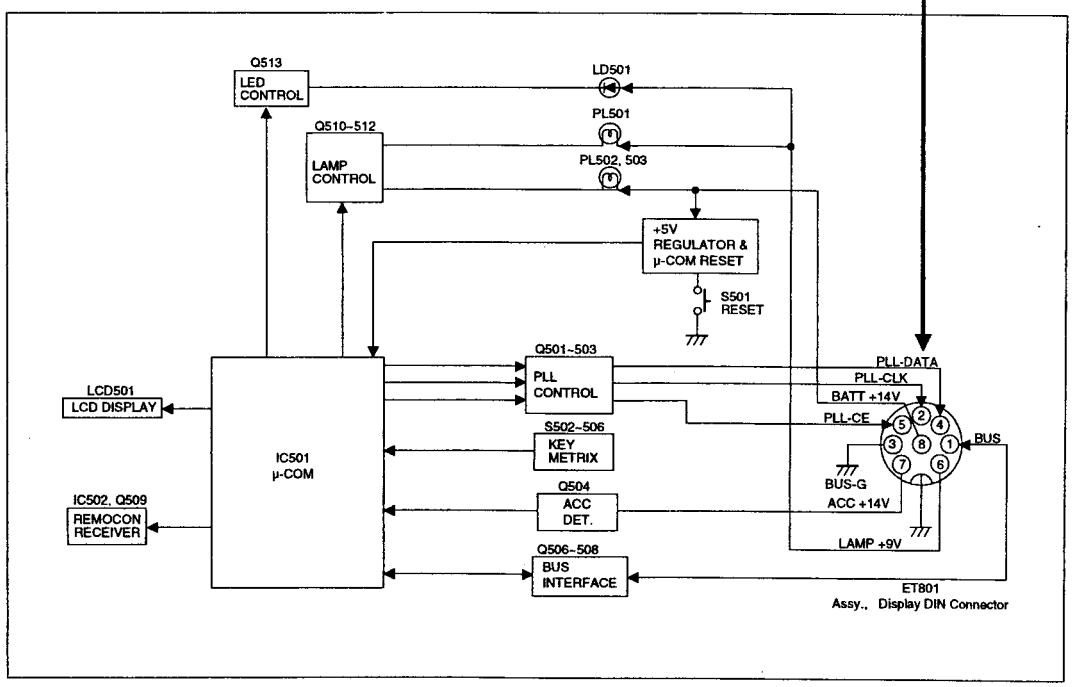
95030W01 : IC501

No.	Symbol	I/O	Terminal Description
1	V_{DD}	—	+5V Power Supply Connect Terminal.
2	NC	—	No Connect Terminal.
⌇			
12			
13	VLCD3	I	Bias Voltage Input Terminal for LCD Driver.
14	VLCD2		
15	VLCD1		
16	GND	—	GND Connect Terminal.
17	V_{PP}	—	+5V Connect Terminal.
18	GND	—	GND Connect Terminal.
19	NC	—	No Connect Terminal.
20	$\overline{\text{RESET}}$	I	Reset Signal Input Terminal. (L : Active)
21	X'TAL1	I	System Clock Connect Terminal. (4.19MHz)
22	X'TAL2	O	
23	$\overline{\text{REM+B}}$	O	Power Supply Connect Terminal for Remocon Receiver.
24	NC	—	No Connect Terminal.
25	GND	—	GND Connect Terminal.
26	L-CONT	O	Power Supply Connect Terminal for LCD Backlight.
27	REM-IND	O	Remote Indicator Output Terminal.
28	PLL-CE	O	PLL-CE Output Terminal.
29	PLL-CLK	O	PLL-CLK Output Terminal.
30	PLL-DATA	O	PLL-DATA Output Terminal.
31	POWER-ON	I	Key Data Input Terminal.
32	DISC UP		
33	DISC DN		
34	PLAY / PAU		
35	MS-UP		
36	MS-DN		
37	M.I.X.		
38	REPEAT		
39	SCAN		
40	GND	—	GND Connect Terminal.
41	REMOCON1	I	Remocon Data Input Terminal.
42	REMOCON2		
43	$\overline{\text{B-HOLD}}$	I	Battery Detect Signal Input Terminal.
44	BUS-OUT	O	BUS Signal Output Terminal.
45	BUS-IN	I	BUS Signal Input Terminal.
46	$\overline{\text{A-HOLD}}$	I	ACC Detect Signal Input Terminal.

No.	Symbol	I/O	Terminal Description
47	V_{DD}	—	+5V Power Supply Connect Terminal.
48	NC	—	No Connect Terminal.
49	NC	—	No Connect Terminal.
50	COM1	O	LCD Common 1 Output Terminal.
51	COM2	O	LCD Common 2 Output Terminal.
52	SEG1	O	LCD Control Ouput Terminal.
53	SEG2		
54	SEG3		
55	SEG4		
56	SEG5		
57	SEG6		
58	SEG7		
59	SEG8		
60	V_{SS}	—	GND Connect Terminal.
61	SEG9	O	LCD Control Output Terminal.
62	SEG10		
63	SEG11		
64	SEG12		
65	SEG13		
66	SEG14		
67	SEG15		
68	SEG16		
69	SEG17		
70	SEG18		
71	SEG19		
72	SEG20		
73	SEG21		
74	SEG22		
75	SEG23		
76	SEG24		
77	SEG25		
78	SEG26		
79	SEG27		
80	SEG28		

Block Diagram

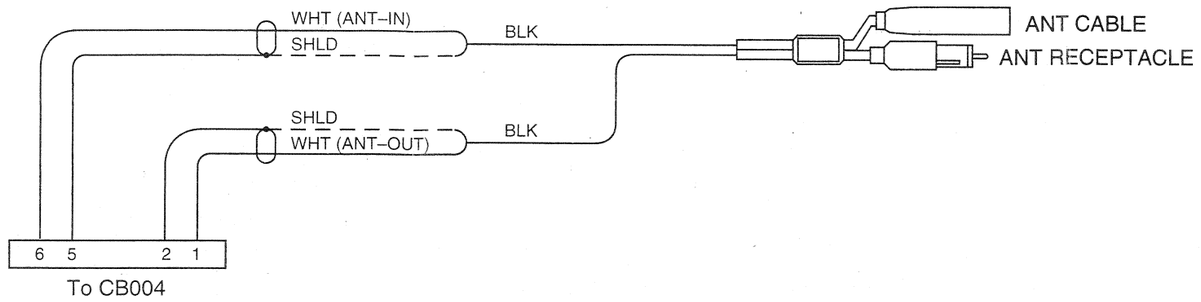




MEMO

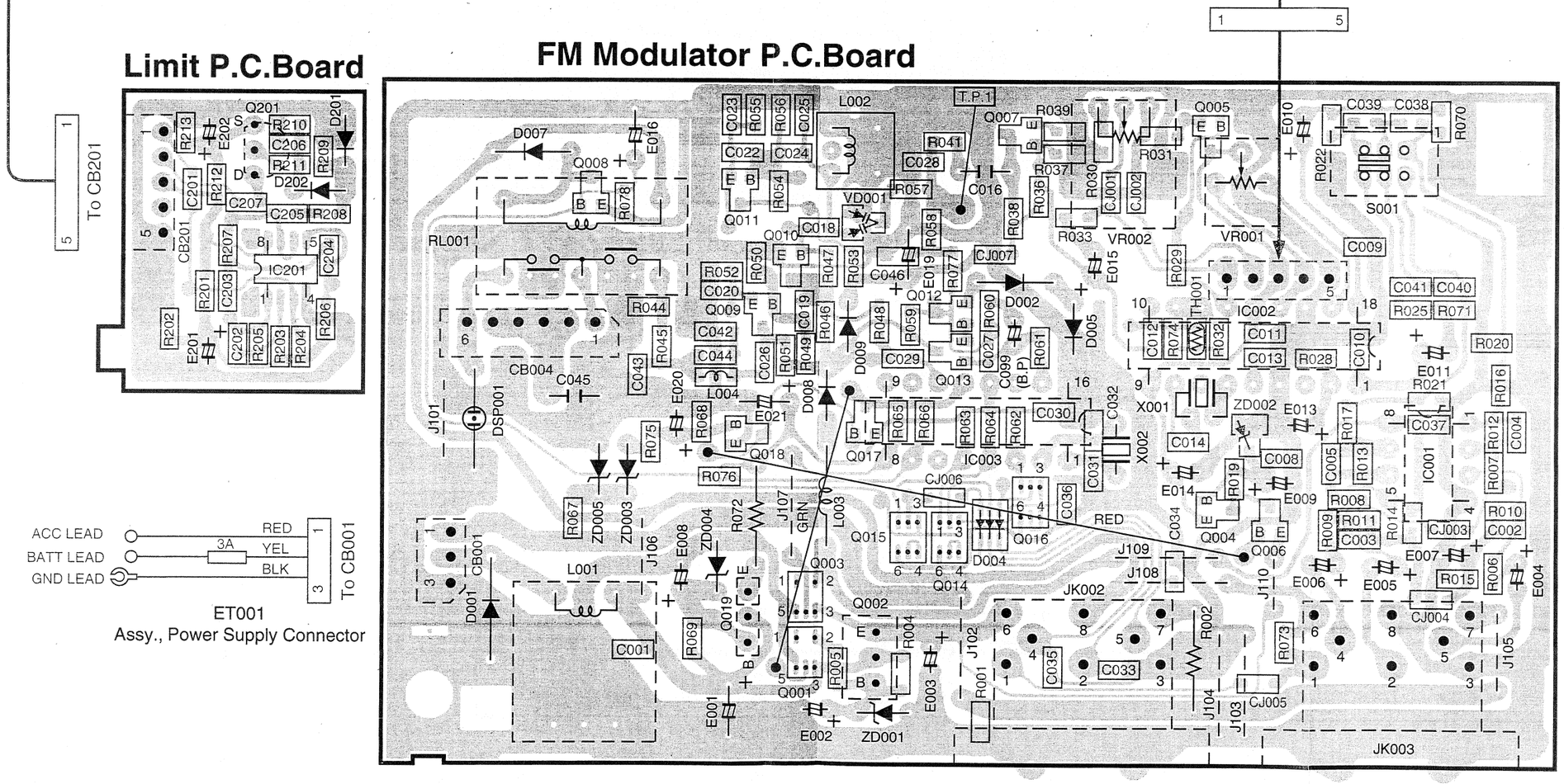
Parts Layout on P.C. Boards and Wiring Diagram (1/2)

All P.C. Boards viewed from soldered side.



Limit P.C.Board

FM Modulator P.C.Board

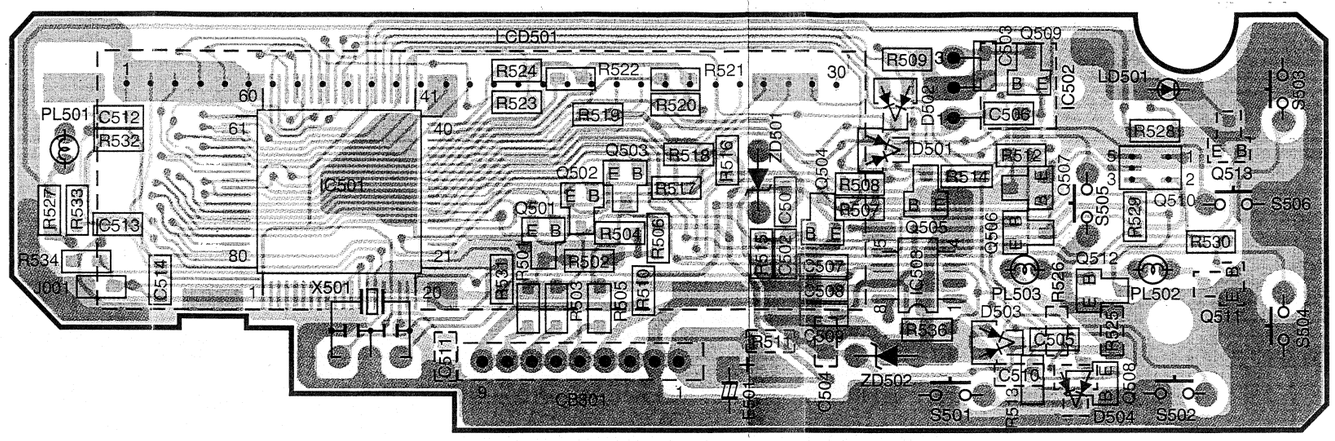


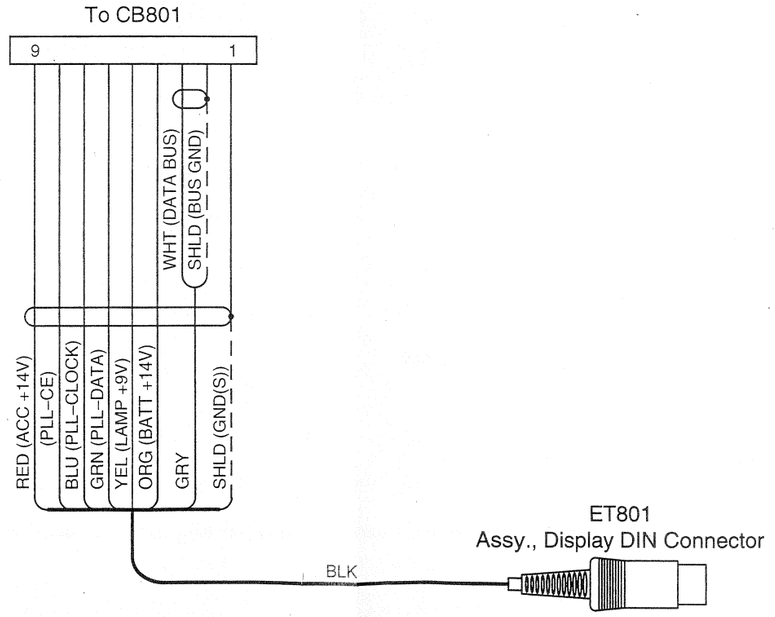
Blue Color Pattern : Foil Side Pattern

Parts Layout on P.C. Boards and Wiring Diagram (2/2)

All P.C. Boards viewed from soldered side.

Remote Display P.C.Board





Orange Color Pattern : Component Side Pattern
Blue Color Pattern : Foil Side Pattern

ALPI-00601 / DRUCK: 4

Schematic Diagram

IC	IC201(2/2)	IC003	IC002 IC201(1/2)	IC001	IC501	IC502	IC513
Transistor (Q)	Q009 Q010 Q011 Q008 Q017	Q007 Q201 Q005 Q012 Q013	Q001	Q014 Q015 Q016 Q018 Q002 Q003	Q019 Q006 Q004	Q509 Q505 Q503 Q504 Q508 Q507 Q502 Q506 Q501	Q513

ET002
Assy.,ANTENNA CABLE
ANTENNA CABLE (ANT-IN) (GND)
ANTENNA RECEPTACLE (GND) (ANT-OUT)

FM Modulator P.C.Board

ISOLATOR AMP IC001 NJM4558D

Limit P.C.Board

FM STEREO MODULATOR

IC002 BA1405

IC003 BU2611

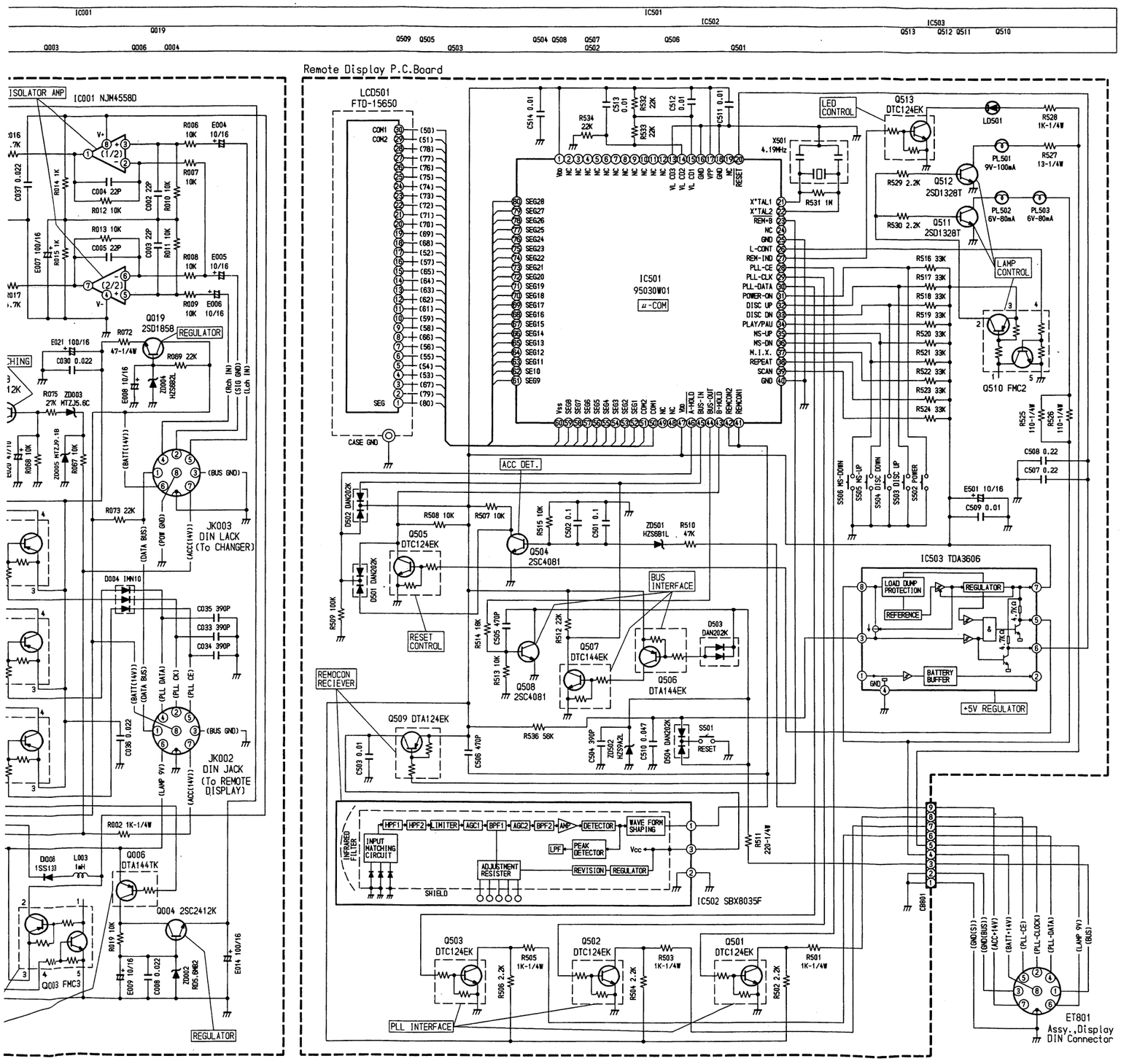
Remote Display P.C.Board

LCD501 FTD-15650

IC501 95030W01 μ-COM

IC502 SBX8035F

ET001
Assy.,POWER SUPPLY CONNECTOR
ACC Lead (ACC)
BATT Lead (BATT) 3A
GND Lead (GND)



IC001

1-3	4.7V
4	0V
5-7	4.7V
8	9.4V

IC002

1,2	3.2V	10	NC
3	NC	11	4.3V
4	0V	12	NC
5	1.3V	13	2.8V
6	1V	14	4.7V
7	NC	15	3.2V
8	2.3V	16	0V
9	4.7V	17, 18	3.2V

IC003

1	2.1V	11	2.2V
2	1.8V	12	4.5V
3-5	0.7V	13	4.6V
6	NC	14	NC
7	3.3V	15	2.1V
8	3.7V	16	0V
9, 10	NC		

IC201

1-3	2.4V
4	0V
5-7	2.4V
8	4.7V

IC502

1	4.9V
2	0V
3	4.9V

IC501

1	4.9V	23	0V
2-12	NC	24	NC
13	0.6V	25	0V
14	2V	26-39	4.9V
15	3.5V	40	0V
16	0V	41, 42	4.9V
17	4.9V	43, 44	0V
18	0V	45	3.9V
19	NC	46	0.2V
20	4.9V	47	4.9V
21	2.7V	48, 49	NC
22	2.1V	50-80	2.8V

IC503

1,2	NC
3	2.5V
4	0V
5	4V
6, 7	4.9V
8	14V

	E	C	B		E	C	B
Q002	9.6V	14.3V	10.2V	Q019	4.9V	14.3V	5.5V
Q004	4.8V	9.5V	5.4V	Q501	0V	0V	5.1V
Q005	2.2V	4.7V	2.8V	Q502	0V	0V	5.1V
Q006	9.3V	9.1V	0V	Q503	0V	0V	5.1V
Q007	1.6V	5.2V	2.2V	Q504	0V	0V	0.6V
Q008	0V	0V	1.8V	Q505	0V	0V	4.2V
Q009	0.4V	6V	1V	Q506	5.1V	0V	5.1V
Q010	0V	2.4V	0.7V	Q507	0V	5.1V	0V
Q011	3.1V	7.6V	3.8V	Q508	0V	8.3V	0V
Q012	0V	3.9V	1.6V	Q509	4.9V	4.9V	0V
Q013	1.6V	8.3V	2V	Q511	0V	0V	0.8V
Q017	4.6V	4.5V	0V	Q512	0V	0V	0.8V
Q018	0V	0V	0.6V	Q513	0V	0V	4.9V

	S	G	D
Q201	1V	0V	0.9V

	1	2	3	4	5
Q001	NC	14V	14V	4.6V	0V
Q003	NC	9.5V	9.6V	3.8V	0V
Q510	NC	4.9V	4.9V	4.9V	0V

	1	2	3	4	5	6
Q014	0V	0.7V	4.8V	4.8V	4.8V	0V
Q015	0V	0.7V	4.8V	4.8V	4.8V	0V
Q016	0V	0.7V	4.8V	4.8V	4.8V	0V

[Measuring Conditions]

- Power Supply Voltage : DC14.4V
- Measuring Meter : Digital Multi Voltmeter
- Measuring Point Reference : Between Ground
- Measuring Conditions : CD : Be Playing back the 1st. Music of the Test CD (TCD-782)
  TUNER : No signal input
  FM : 88.7MHz

[端子電圧測定条件]

1. 電源電圧 : DC14.4V
2. 測定機器 : デジタル・マルチ・ボルトメーター
3. 測定基準 : 対アース間
4. 測定条件 : CD : テストCD (TCD-782) の1曲目再生
   チューナー : 無信号入力
   FM : 88.7MHz

NOTE:

1. All resistance values are in ohms. K = 1,000
2. All capacitance values are in microfarads. $P = \frac{1}{1{,}000{,}000}$

Electrical Parts List

● Remote Display/FM Modulator Unit

Resistor : Carbon resistors under 1/4 watts are not mentioned in the parts list, please confirm them by schematic diagram.

Capacitor : μF=microfarads,pF=picofarads

Abbreviations	
RES.= Resistor	CAP.= Capacitor
C.F.= Carbon Film	ELY.= Electrolytic
M.F.= Metal Film	CER.= Ceramic
M.O.= Metal Oxide Film	MYL.= Mylar
M.P.= Metal Plate	TAN.= Tantalum
TR. = Transistor	POLY.= Polystyrol
TRANS.= Transformer	PP. = Polypropylene
CP. = Chip	PLT.= Polyethylene
	PF. = Polyester Film

Symbol No.	Part No.	Description
FM Modulator P.C.Board		
IC's		
IC001	51E23566S01	NJM4558D
IC002	51T55534W01	BA1405
IC003	51T55677W01	BU2611
Transistors		
Q001	48T73888F13	CP., FMC3
Q002	48T56031F01	2SD1266
Q003	48T73888F13	CP., FMC3
Q004	48E23845S01	CP., 2SC2412K
Q005	48T25196W01	CP., 2SC2412KLU
Q006	48E05937S03	CP., DTA144TK
Q007	48T25196W01	CP., 2SC2412KLU
Q008	48E22095S01	CP., DTC143XK
Q009	48T55538W02	CP., 2SC2814
Q010	48T55538W02	CP., 2SC2814
Q011	48T55538W02	CP., 2SC2814
Q012	48T25196W01	CP., 2SC2412KLU
Q013	48T25196W01	CP., 2SC2412KLU
Q014	48T16335W03	CP., IMD2
Q015	48T16335W03	CP., IMD2
Q016	48T16335W03	CP., IMD2
Q017	48E05937S03	CP., DTA144TK
Q018	48E23845S01	CP., 2SC2412K
Q019	48E09401S01	2SD1858
Diodes / Surge Protector		
D001	48E23590S01	10E2
D002	48E22916S01	1SS133

Symbol No.	Part No.	Description
D004	48E11277S01	CP., IMN10
D005	48E22916S01	1SS133
D007	48E23543S01	1SS136
D008	48E22916S01	1SS133
D009	48E22916S01	1SS133
ZD001	48T83128F28	Zener, HZS11A1L
ZD002	48T62934F22	Zener, CP. RD5.6MB2
ZD003	48E24378S01	Zener, MTZJ5.6C
ZD004	48T83128F05	Zener, HZS6B2L
ZD005	48E22162S01	Zener, MTZJ9.1B
VD001	48E25300S01	Varactor, CP. KV1440-2
DSP001	48T81909F01	Surge Protector, DSP-201M
Coils		
L001	24E23567S01	Choke
L002	24E23568S01	FM OSC
L003	24E09406S01	Inductor, 1mH
L004	24E23584S01	Inductor, CP. 0.22μH
Crystals		
X001	91E25242S01	38KHz
X002	91E24846S01	7.2MHz
Relay / Thermistor		
RL001	80T55536W01	Relay, UM1-12WK
TH001	48T35484W11	CP., 100K ohm
Switch		
S001	40E25243S01	Slide, SSS722SA011 (PRE-EMPHASIS)
Capacitors		
C001	08E22088S01	CP., 0.1μF
E001	23E09551S07	ELY., 1000μF / 16V
C002	08E20550S01	CP., 22pF
E002	23E22099S01	ELY., 10μF / 16V
C003	08E20550S01	CP., 22pF
E003	23E22099S01	ELY., 10μF / 16V
C004	08E20550S01	CP., 22pF

Symbol No.	Part No.	Description
E004	23E22099S01	ELY., 10μF / 16V
C005	08E20550S01	CP., 22pF
E005	23E22099S01	ELY., 10μF / 16V
E006	23E22099S01	ELY., 10μF / 16V
E007	23E23585S01	ELY., 100μF / 16V
C008	08E22085S01	CP., 0.022μF
E008	23E08383S08	ELY., 10μF / 16V
C009	08E23583S01	CP., 1000pF
E009	23E08383S08	ELY., 10μF / 16V
C010	08E23583S01	CP., 1000pF
E010	23E22099S01	ELY., 10μF / 16V
C011	08E22085S01	CP., 0.022μF
E011	23E22099S01	ELY., 10μF / 16V
C012	08E08423S07	CP., 220pF
C013	08E23583S01	CP., 1000pF
E013	23E08383S08	ELY., 10μF / 16V
C014	08E23578S01	CP., 12pF
E014	23E23585S01	ELY., 100μF / 16V
E015	23E22099S01	ELY., 10μF / 16V
C016	08E22159S01	PF., 1μF
E016	23E23587S01	ELY., 47μF / 16V
C018	08E23577S01	CP., 1pF
C019	08E08423S02	CP., 2pF
E019	23E23589S01	ELY., 2200μF / 10V
C020	08E22085S01	CP., 0.022μF
E020	23E25250S01	ELY., 47μF / 10V
E021	23E23588S01	ELY., 100μF / 16V
C022	08E23581S01	CP., 33pF
C023	08E23579S01	CP., 18pF
C024	08E08423S03	CP., 10pF
C025	08E20550S01	CP., 22pF
C026	08E08423S02	CP., 2pF
C027	08E22085S01	CP., 0.022μF
C028	08E22080S01	CP., 470pF
C029	08E22083S01	CP., 0.01μF
C030	08E22085S01	CP., 0.022μF
C031	08E23578S01	CP., 12pF
C032	08E23578S01	CP., 12pF
C033	08E23557S01	CP., 390pF
C034	08E23557S01	CP., 390pF
C035	08E23557S01	CP., 390pF
C036	08E22085S01	CP., 0.022μF
C037	08E22085S01	CP., 0.022μF
C038	08E08577S02	CP., 1500pF
C039	08E23583S01	CP., 1000pF
C040	08E08577S02	CP., 1500pF
C041	08E23583S01	CP., 1000pF
C042	08E23579S01	CP., 18pF
C043	08E23579S01	CP., 18pF

Symbol No.	Part No.	Description
C044	08E23582S01	CP., 2pF
C045	08E22159S01	PF., 1μF
C046	08E22088S01	CP., 0.1μF
C099	23E25249S01	ELY., (B.P) 22μF / 16V
Resistors		(All resistors are chip 1/10W±5% unless otherwise noted.)
R001	06E22929S01	3.3K ohm 1/4W
R004	06E22036S01	22K ohm 1/8W
R005	06E23901S01	220 ohm 1/4W
R006	06E20903S01	10K ohm
R007	06E20903S01	10K ohm
R008	06E20903S01	10K ohm
R009	06E20903S01	10K ohm
R010	06E20903S01	10K ohm
R011	06E20903S01	10K ohm
R012	06E20903S01	10K ohm
R013	06E20903S01	10K ohm
R014	06E22048S01	1K ohm
R015	06E22048S01	1K ohm
R016	06E22033S01	4.7K ohm 1/8W
R017	06E22033S01	4.7K ohm 1/8W
R019	06E20903S01	10K ohm
R020	06E23572S01	820 ohm
R021	06E23572S01	820 ohm
R022	06E22055S01	4.7K ohm
R025	06E22055S01	4.7K ohm
R028	06E22054S01	3.9K ohm
R029	06E22030S01	1K ohm 1/8W
R030	06E22050S01	1.8K ohm
R031	06E22504S01	2.2K ohm 1/8W
R032	06E23574S01	180K ohm
R033	06E22052S01	2.7K ohm
R036	06E23575S01	330K ohm
R037	06E22509S01	150K ohm
R038	06E22050S01	1.8K ohm
R039	06E22049S01	1.2K ohm
R041	06E20903S01	10K ohm
R044	06E22954S01	68 ohm 1/4W
R045	06E22548S01	470 ohm 1/4W
R046	06E22051S01	2.2K ohm
R047	06E22065S01	100K ohm
R048	06E21161S01	100 ohm 1/8W
R049	06E22067S01	470K ohm
R050	06E22509S01	150K ohm
R051	06E22050S01	1.8K ohm

ALPI-00601 /DRUCK: 7

Symbol No.	Part No.	Description
E004	23E22099S01	ELY., 10μF / 16V
C005	08E20550S01	CP., 22pF
E005	23E22099S01	ELY., 10μF / 16V
E006	23E22099S01	ELY., 10μF / 16V
E007	23E23585S01	ELY., 100μF / 16V
C008	08E22085S01	CP., 0.022μF
E008	23E08383S08	ELY., 10μF / 16V
C009	08E23583S01	CP., 1000pF
E009	23E08383S08	ELY., 10μF / 16V
C010	08E23583S01	CP., 1000pF
E010	23E22099S01	ELY., 10μF / 16V
C011	08E22085S01	CP., 0.022μF
E011	23E22099S01	ELY., 10μF / 16V
C012	08E08423S07	CP., 220pF
C013	08E23583S01	CP., 1000pF
E013	23E08383S08	ELY., 10μF / 16V
C014	08E23578S01	CP., 12pF
E014	23E23585S01	ELY., 100μF / 16V
E015	23E22099S01	ELY., 10μF / 16V
C016	08E22159S01	PF., 1μF
E016	23E23587S01	ELY., 47μF / 16V
C018	08E23577S01	CP., 1pF
C019	08E08423S02	CP., 2pF
E019	23E23589S01	ELY., 2200μF / 10V
C020	08E22085S01	CP., 0.022μF
E020	23E25250S01	ELY., 47μF / 10V
E021	23E23588S01	ELY., 100μF / 16V
C022	08E23581S01	CP., 33pF
C023	08E23579S01	CP., 18pF
C024	08E08423S03	CP., 10pF
C025	08E20550S01	CP., 22pF
C026	08E08423S02	CP., 2pF
C027	08E22085S01	CP., 0.022μF
C028	08E22080S01	CP., 470pF
C029	08E22083S01	CP., 0.01μF
C030	08E22085S01	CP., 0.022μF
C031	08E23578S01	CP., 12pF
C032	08E23578S01	CP., 12pF
C033	08E23557S01	CP., 390pF
C034	08E23557S01	CP., 390pF
C035	08E23557S01	CP., 390pF
C036	08E22085S01	CP., 0.022μF
C037	08E22085S01	CP., 0.022μF
C038	08E08577S02	CP., 1500pF
C039	08E23583S01	CP., 1000pF
C040	08E08577S02	CP., 1500pF
C041	08E23583S01	CP., 1000pF
C042	08E23579S01	CP., 18pF
C043	08E23579S01	CP., 18pF

Symbol No.	Part No.	Description
C044	08E23582S01	CP., 2pF
C045	08E22159S01	PF., 1μF
C046	08E22088S01	CP., 0.1μF
C099	23E25249S01	ELY., (B.P) 22μF / 16V
Resistors		(All resistors are chip 1/10W±5% unless otherwise noted.)
R001	06E22929S01	3.3K ohm 1/4W
R004	06E22036S01	22K ohm 1/8W
R005	06E23901S01	220 ohm 1/4W
R006	06E20903S01	10K ohm
R007	06E20903S01	10K ohm
R008	06E20903S01	10K ohm
R009	06E20903S01	10K ohm
R010	06E20903S01	10K ohm
R011	06E20903S01	10K ohm
R012	06E20903S01	10K ohm
R013	06E20903S01	10K ohm
R014	06E22048S01	1K ohm
R015	06E22048S01	1K ohm
R016	06E22033S01	4.7K ohm 1/8W
R017	06E22033S01	4.7K ohm 1/8W
R019	06E20903S01	10K ohm
R020	06E23572S01	820 ohm
R021	06E23572S01	820 ohm
R022	06E22055S01	4.7K ohm
R025	06E22055S01	4.7K ohm
R028	06E22054S01	3.9K ohm
R029	06E22030S01	1K ohm 1/8W
R030	06E22050S01	1.8K ohm
R031	06E22504S01	2.2K ohm 1/8W
R032	06E23574S01	180K ohm
R033	06E22052S01	2.7K ohm
R036	06E23575S01	330K ohm
R037	06E22509S01	150K ohm
R038	06E22050S01	1.8K ohm
R039	06E22049S01	1.2K ohm
R041	06E20903S01	10K ohm
R044	06E22954S01	68 ohm 1/4W
R045	06E22548S01	470 ohm 1/4W
R046	06E22051S01	2.2K ohm
R047	06E22065S01	100K ohm
R048	06E21161S01	100 ohm 1/8W
R049	06E22067S01	470K ohm
R050	06E22509S01	150K ohm
R051	06E22050S01	1.8K ohm

Symbol No.	Part No.	Description
R052	06E22043S01	330 ohm
R053	06E23571S01	47 ohm
R054	06E20903S01	10K ohm
R055	06E22053S01	3.3K ohm
R056	06E20903S01	10K ohm
R057	06E22034S01	10K ohm 1/8W
R058	06E22128S01	8.2K ohm 1/8W
R059	06E20903S01	10K ohm
R060	06E22049S01	1.2K ohm
R061	06E20903S01	10K ohm
R062	06E22060S01	22K ohm
R063	06E22060S01	22K ohm
R064	06E22060S01	22K ohm
R065	06E22127S01	2.7K ohm 1/8W
R066	06E22127S01	2.7K ohm 1/8W
R067	06E22034S01	10K ohm 1/8W
R068	06E20903S01	10K ohm
R069	06E22036S01	22K ohm 1/8W
R070	06E22063S01	56K ohm
R071	06E22063S01	56K ohm
R073	06E22060S01	22K ohm
R074	06E23573S01	82K ohm
R075	06E20904S01	27K ohm
R076	06E22053S01	3.3K ohm
R077	06E22504S01	2.2K ohm 1/8W
R078	06E20903S01	10K ohm
VR001	18E25247S01	Variable, 50K ohm (PHASE)
VR002	18E25241S01	Volume, Rotary 10K ohm (OUTPUT LEVEL)
Remote Display P.C.Board		
IC's		
IC501	51T95030W01	MC68HC05L5
IC502	51T95040W01	SBX8035F
IC503	51T85450W01	TDA3606
Transistors		
Q501	48E10426S01	CP., DTC124EK
Q502	48E10426S01	CP., DTC124EK
Q503	48E10426S01	CP., DTC124EK
Q504	48T94582F01	CP., 2SC4081
Q505	48E10426S01	CP., DTC124EK
Q506	48E23697S01	CP., DTA144EK

Symbol No.	Part No.	Description
Q507	48E22555S01	CP., DTC144EK
Q508	48T94582F01	CP., 2SC4081
Q509	48E22092S01	CP., DTA124EK
Q510	48E11274S01	CP., FMC2
Q511	48T63788F04	CP., 2SD1328T
Q512	48T63788F04	CP., 2SD1328T
Q513	48E10426S01	CP., DTC124EK
Diodes		
D501	48E10945S01	CP., DAN202K
D502	48E10945S01	CP., DAN202K
D503	48E10945S01	CP., DAN202K
D504	48E10945S01	CP., DAN202K
ZD501	48T25766W04	Zener, HZS6B1L
ZD502	48T25766W20	Zener, HZS9A2L
Switches		
S501	40T75234W01	Tact, SKQNAC (RESET)
S502	40T75234W01	Tact, SKQNAC (POWER)
S503	40T75234W01	Tact, SKQNAC (DISC UP)
S504	40T75234W01	Tact, SKQNAC (DISC DOWN)
S505	40T75234W01	Tact, SKQNAC (MS-UP)
S506	40T75234W01	Tact, SKQNAC (MS-DOWN)
Crystal		
X501	91T15285W01	CER., Lock 4.19MHz
Lamps/LED		
○ PL501	65T85125W03	9V-100mA
△ PL501	65T85125W03	9V-100mA
□ PL501	65T85125W02	9V-100mA
PL502	65T75232W01	6V-80mA
PL503	65T75232W01	6V-80mA
LD501	48T65477W02	LED, SML-010LTT87 (RED)
Capacitors		
C501	08E22088S01	CP., 0.1μF
E501	23E25301S01	ELY., 10μF / 16V
C502	08E22088S01	CP., 0.1μF
C503	08E22083S01	CP., 0.01μF
C504	08E23557S01	CP., 390pF
C505	08E22080S01	CP., 470pF
C506	08E22080S01	CP., 470pF

NOTE : ○ : For North American Model Only, △ : For General Foreigh Model Only,
□ : For Japanese Model Only, Others : Common.

ALPI-0060 1 / DRUCK: 8

Symbol No.	Part No.	Description
C507	08E25236S01	CP., 0.22μF
C508	08E25236S01	CP., 0.22μF
C509	08E22083S01	CP., 0.01μF
C510	08E22087S01	CP., 0.047μF
C511	08E22083S01	CP., 0.01μF
C512	08E22083S01	CP., 0.01μF
C513	08E22083S01	CP., 0.01μF
C514	08E22083S01	CP., 0.01μF
Resistors		(All resistors are chip 1/10W±5% unless otherwise noted.)
R501	06E22074S01	1K ohm 1/4W
R502	06E22504S01	2.2K ohm 1/8W
R503	06E22074S01	1K ohm 1/4W
R504	06E22051S01	2.2K ohm
R505	06E22074S01	1K ohm 1/4W
R506	06E22051S01	2.2K ohm
R507	06E20903S01	10K ohm
R508	06E20903S01	10K ohm
R509	06E22065S01	100K ohm
R510	06E22062S01	47K ohm
R511	06E20752S01	220 ohm 1/4W
R512	06E22060S01	22K ohm
R513	06E20903S01	10K ohm
R514	06E22059S01	18K ohm
R515	06E20903S01	10K ohm
R516	06E22061S01	33K ohm
R517	06E22061S01	33K ohm
R518	06E22061S01	33K ohm
R519	06E22061S01	33K ohm
R520	06E22061S01	33K ohm
R521	06E22061S01	33K ohm
R522	06E22061S01	33K ohm
R523	06E22061S01	33K ohm
R524	06E22061S01	33K ohm
R525	06E25235S01	110 ohm 1/4W
R526	06E25235S01	110 ohm 1/4W
R527	06E25234S01	13 ohm 1/4W
R528	06E22074S01	1K ohm 1/4W
R529	06E22051S01	2.2K ohm
R530	06E22051S01	2.2K ohm
R531	06E22068S01	1M ohm
R532	06E22060S01	22K ohm
R533	06E22060S01	22K ohm
R534	06E22060S01	22K ohm
R536	06E25388S01	56K ohm 1/8W

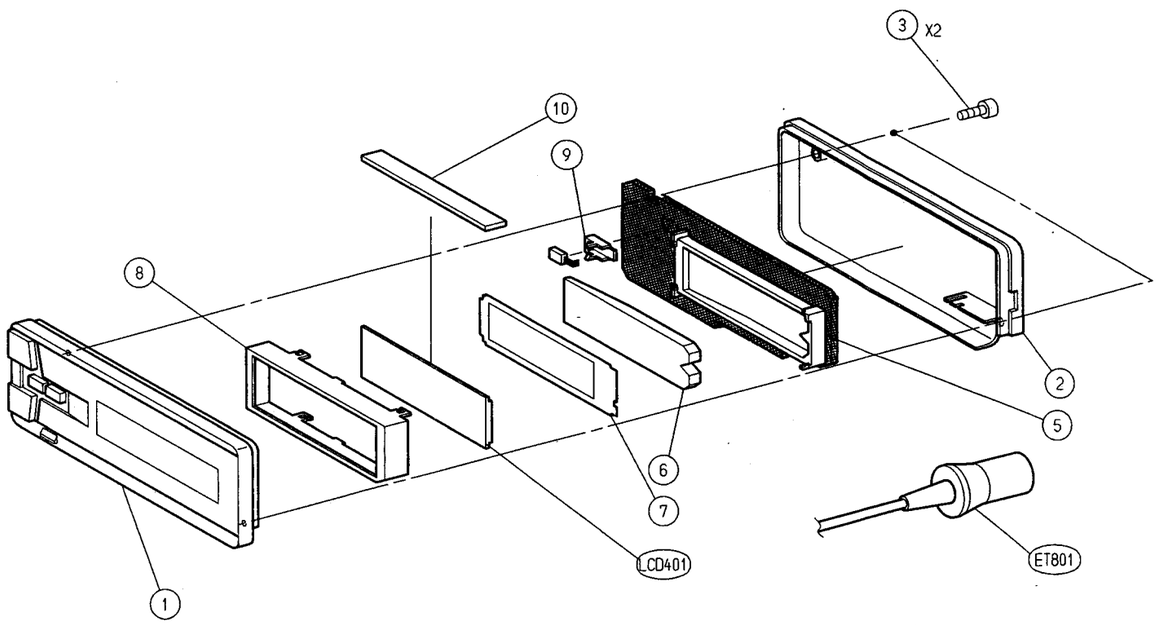
Symbol No.	Part No.	Description
Limit P.C.Board		
IC		
IC201	51E20551S01	NJM4558M
Transistor		
Q201	48T74193F05	FET, 2SK163
Diodes		
D201	48E22916S01	1SS133
D202	48E22916S01	1SS133
Capacitors		
C201	08E24197S01	CP., 0.022μF
E201	23E09402S05	ELY., 4.7μF / 25V
C202	08E20550S01	CP., 22pF
E202	23E09402S05	ELY., 4.7μF / 25V
C203	08E22085S01	CP., 0.022μF
C204	08E22085S01	CP., 0.022μF
C205	08E20767S01	CP., 3300pF
C206	08E22085S01	CP., 0.022μF
C207	08E22085S01	CP., 0.022μF
Resistors		(All resistors are chip 1/10W±5% unless otherwise noted.)
R201	06E22034S01	10K ohm 1/8W
R202	06E20903S01	10K ohm
R203	06E21164S01	1.5K ohm
R204	06E22065S01	100K ohm
R205	06E22060S01	22K ohm
R206	06E22037S01	100K ohm 1/8W
R207	06E22060S01	22K ohm
R208	06E21164S01	1.5K ohm
R209	06E22065S01	100K ohm
R210	06E22065S01	100K ohm
R211	06E22065S01	100K ohm
R212	06E22057S01	8.2K ohm
R213	06E22051S01	2.2K ohm

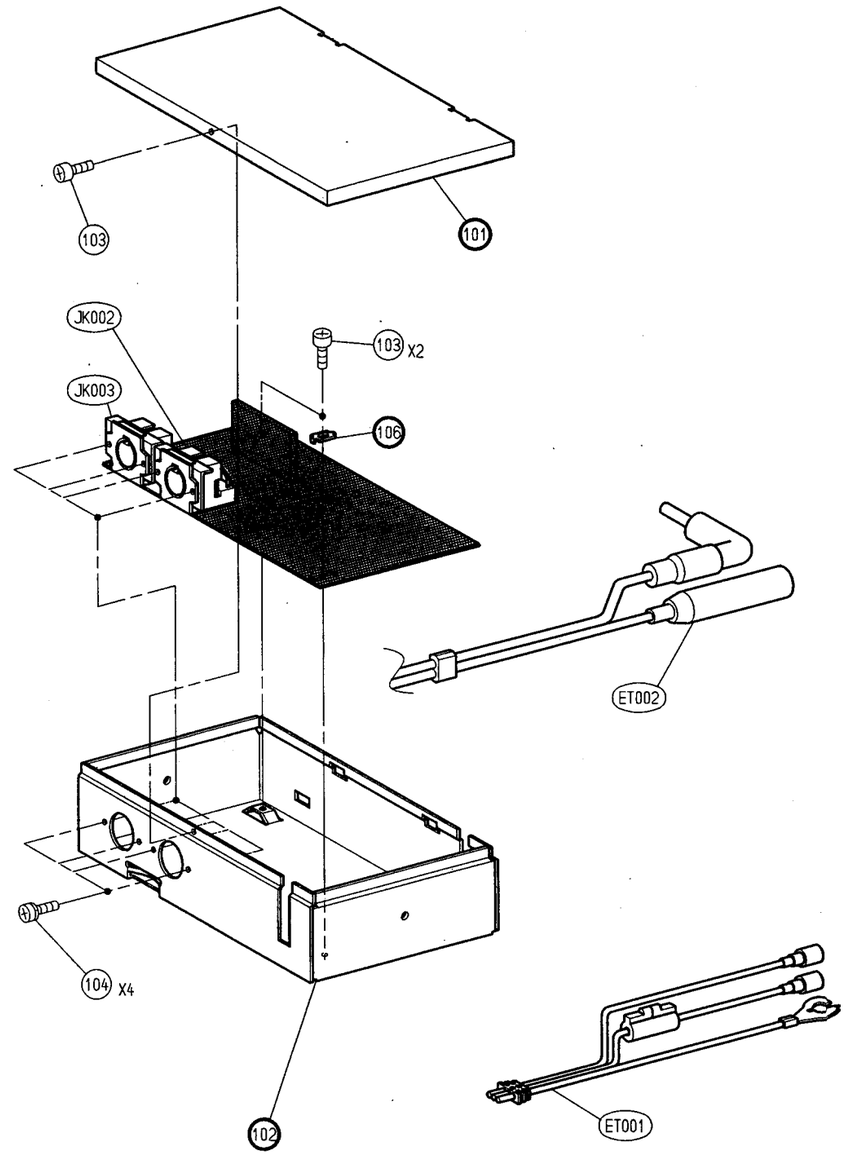
Symbol No.	Part No.	Description
Miscellaneous		
ET001	01E23565S01	Assy., Power Supply Connector
ET002	01E25216S01	Assy., Antenna Cable
ET801	01E25263S01	Assy., DIN Connector 8P
JK002	09E23570S01	DIN Jack 8P (To REMOTE DISPLAY)
JK003	09E23569S01	DIN Jack 8P (To CHANGER)
○ LCD501	65T95171W02	LCD Display
△ LCD501	65T95171W02	LCD Display
□ LCD501	65T95336W01	LCD Display

NOTE : ○ : For North American Model Only, △ : For General Foreigh Model Only,
□ : For Japanese Model Only, Others : Common.

ALPI-00601 /DRUCK: 9

Exploded View (Cabinet)





Cabinet Assembly Parts List

● Remote Display/FM Modulator Unit

NOTE : No parts number on parts list are not supplied.

Symbol No.		Index	Part No.	Description
	Remote Display Unit			
	1	4-A	01E25262S01	Assy., Nosepiece
	2	4-D	15E25230S01	Nose, Bottom
	3	3-D	03E23665S01	Screw, Tapping (M1.7X12)
	5	4-D	15E22999S01	Case, LCD
	6	4-C	61A22998S01	Lens, LCD
○	7	4-C	26A70309W02	Reflector, Sheet
□	7	4-C	26A70309W01	Reflector, Sheet
△	7	4-C	26A70309W02	Reflector, Sheet
	8	3-A	15E25232S01	Cover, LCD
	9	3-C	43E25233S01	Spacer, Remote
	10	3-C	75T75143W02	Rubber, Electric

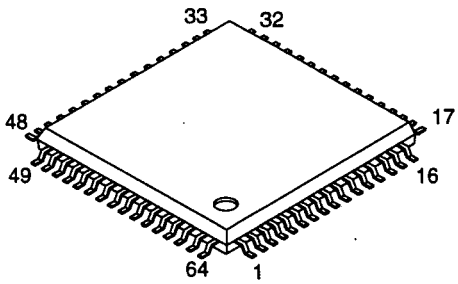
Symbol No.	Index	Part No.	Description
FM Modulator Unit			
103	2-F	03E22575S01	Screw, Pan (M2.6X5)
104	4-F	03E09441S01	Screw, W/Washer (M2.6X8)

NOTE : ○: For North American Model Only, △: For General Foreigh Model Only,
□ : For Japanese Model Only, Others : Common.

Semi-Conductor Lead Identifications

NOTE : For the parts not mentioned, refer to the Schematic Diagram.

95030W01 : IC501



PIN NO.	CODE ADDRESS	I/O	PIN NO.	CODE ADDRESS	I/O	PIN NO.	CODE ADDRESS	I/O	PIN NO.	CODE ADDRESS	I/O
1	V_{DD}	—	21	XTAL1	I	41	REMOCON1	I	61	SEG9	O
2	NC	—	22	XTAL2	O	42	REMOCON2	I	62	SEG10	O
3	NC	—	23	$\overline{\text{REM+B}}$	O	43	$\overline{\text{B-HOLD}}$	I	63	SEG11	O
4	NC	—	24	NC	—	44	BUS-OUT	O	64	SEG12	O
5	NC	—	25	GND	—	45	BUS-IN	I	65	SEG13	O
6	NC	—	26	L-CONT	O	46	$\overline{\text{A-HOLD}}$	I	66	SEG14	O
7	NC	—	27	REM-IND	O	47	V_{DD}	—	67	SEG15	O
8	NC	—	28	PLL-CE	O	48	NC	—	68	SEG16	O
9	NC	—	29	PLL-CLK	O	49	NC	—	69	SEG17	O
10	NC	—	30	PLL-DATA	O	50	COM1	O	70	SEG18	O
11	NC	—	31	POWER-ON	I	51	COM2	O	71	SEG19	O
12	NC	—	32	DISC UP	I	52	SEG1	O	72	SEG20	O
13	VLCD3	I	33	DISC DN	I	53	SEG2	O	73	SEG21	O
14	VLCD2	I	34	PLAY / PAU	I	54	SEG3	O	74	SEG22	O
15	VLCD1	I	35	MS-UP	I	55	SEG4	O	75	SEG23	O
16	GND	—	36	MS-DN	I	56	SEG5	O	76	SEG24	O
17	V_{PP}	—	37	M.I.X.	I	57	SEG6	O	77	SEG25	O
18	GND	—	38	REPEAT	I	58	SEG7	O	78	SEG26	O
19	NC	—	39	SCAN	I	59	SEG8	O	79	SEG27	O
20	$\overline{\text{RESET}}$	I	40	GND	—	60	V_{SS}	—	80	SEG28	O

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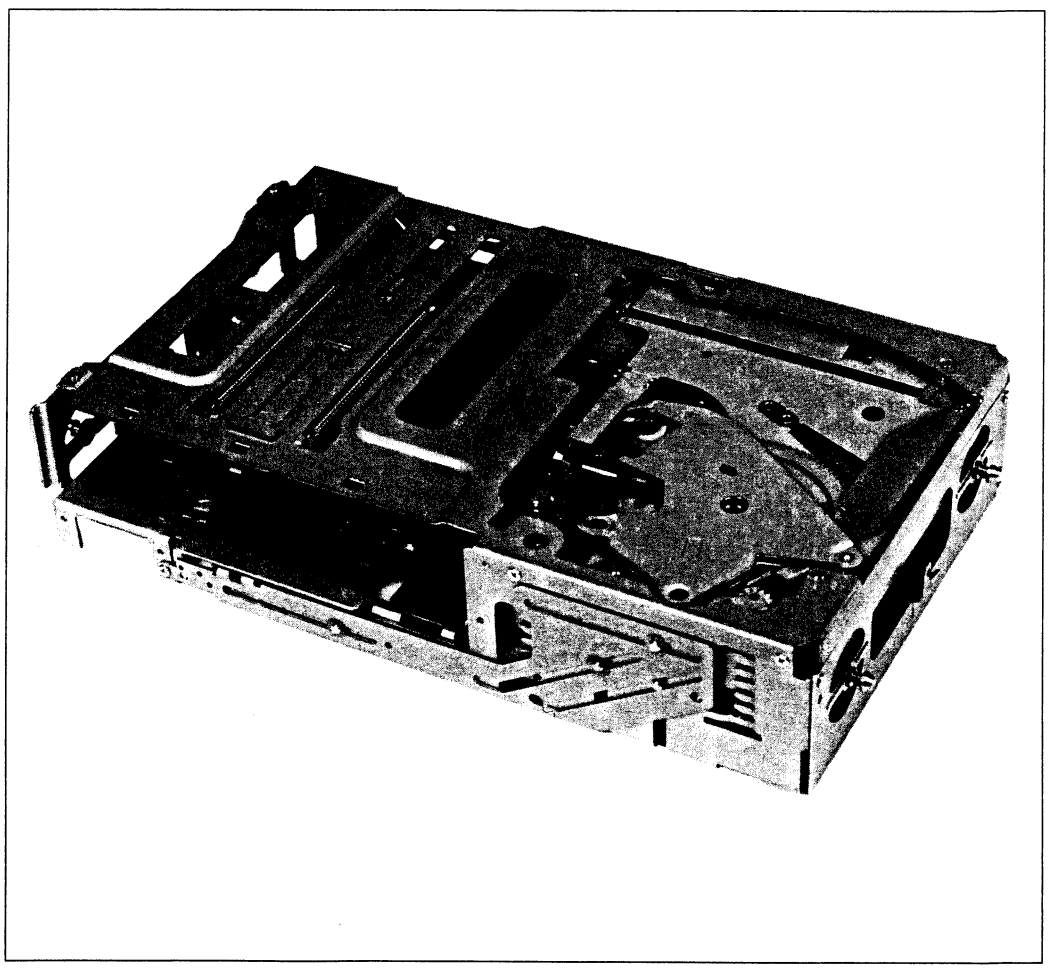
SERVICE MANUAL

V01393

CD Changer Mechanism

CD Shuttle



DT SERIES

Contents

Disassembly Instructions ..... 3 to 7
Mechanism Function Description ..... 8 to 14
Timing Chart ..... 15 to 20
Exploded View (CD Mechanism) ..... 21 to 22
CD Mechanism Assembly Parts List 23

Disassembly Instructions

1. Removal of Riv. Chassis Top Assembly

(1) Remove the spring (1) as shown in Figure 1.
(2) Remove the screw (2) as shown in Figure 1.

1. リベッティング シャーシ トップ組立の外し方

(1) 1本のバネ(1)を外します。(1図参照)
(2) 1本のネジ(2)を外します。(1図参照)

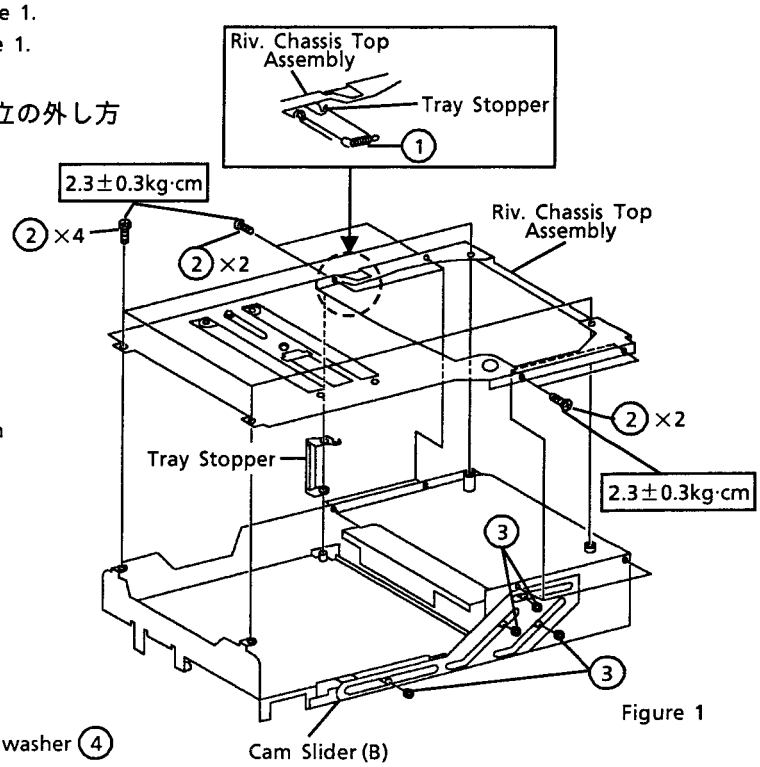


Figure 1

2. Removal of Cam Slider (B)

(1) Remove the four washers (3) as shown in Fugere 1.

2. カム スライダー(B) の外し方

(1) 4個のワッシャー(3)を外します。

3. Removal of Cam Slider (A)

(1) Remove the Rack Gear, by removing the washer (4) as shown in Figure 2.
(2) Remove the Elevator Rack, by removing two screw (5) as shown in Figure 2.
(3) Remove the four washer (6) as shown in Figure 2.

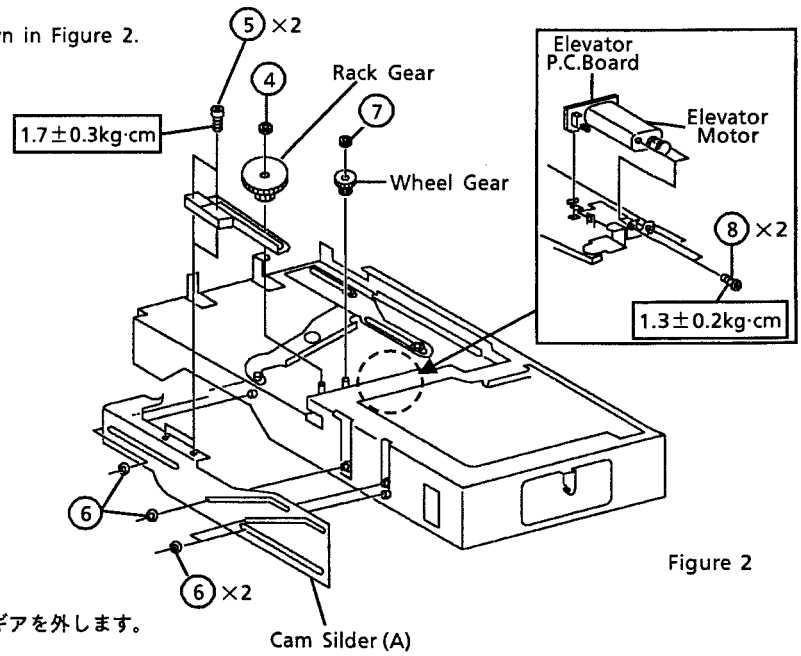


Figure 2

3. カム スライダー(A) の外し方

(1) 1個のワッシャー(4)を外して, ラックギアを外します。(2図参照)
(2) 2本のネジ(5)を外して, エレベーターラックを外します。(2図参照)
(3) 4個のワッシャー(6)を外します。

4. Removal of Elevator Motor

(1) After removal of Elevator Rack, remove the Wheel Gear by removing the washer (7) as shown in Figure 2.
(2) Remove the two screws (8) as shown in Figure 3.
(3) Elevator Motor with the Elevator P.C.Board can be removed completely.

4. エレベーターモーター の外し方

(1) エレベーターラックを外した後，1個のワッシャー (7) を外して，ホイールギアを外します。(2図参照)
(2) 2本のネジ (8) を外します。(3図参照)
(3) 以上でエレベーターモーターはエレベーター基板が付いた状態で外れます。

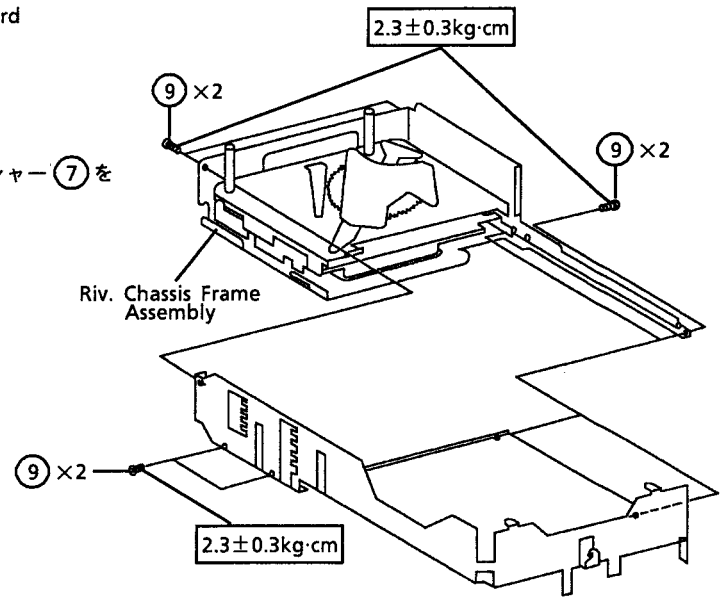


Figure 3

5. Removal of Chassis Frame Assembly

(1) Remove the six screws (9) as shown in Figure 3.

5. シャーシ フレーム組立 の外し方

(1) 6本のネジ (9) を外します。(3図参照)

6. Removal of Chassis Tray Assembly

(1) Remove the two screws (10) as shown in Figure 4.

6. シャーシ トレイ組立 の外し方

(1) 2本のネジ (10) を外します。(4図参照)

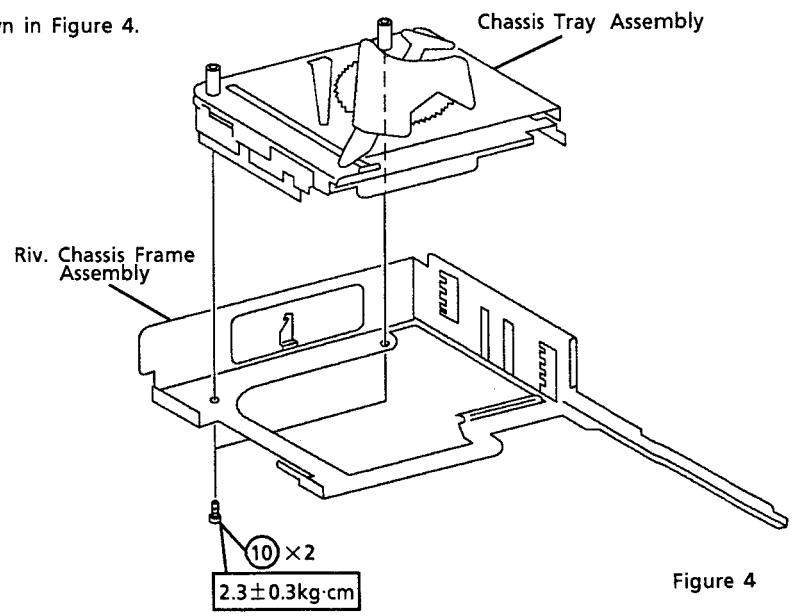


Figure 4

7. Removal of Drive Unit Assembly

(1) Remove the Three solders (11) as shown in Figure 5.
(2) Remove the Bracket Motor Assembly, by removing the screw (12) as shown in Figure 5.
(3) remove the Rod Spring as shown in Figure 5.

7. ドライブユニット組立の外し方

(1) 3箇所の半田(11)を外します。(5図参照)
(2) 1本のネジ(12)を外して，ブラケットモーター組立を外します。(5図参照)
(3) ロッドバネを外します。(5図参照)

8. Removal of Switch P.C.Board

(1) Remove the three solders (13) as shown in Figure 6.
(2) Remove the Switch Arm and Tray Side Guide, by removing the two screws (14) as shown in Figure 6.

8. スイッチ基板の外し方

(1) 3箇所の半田(13)を外します。(6図参照)
(2) 2本のネジ(14)を外して，アーム スイッチとトレイサイドガイドを外します。(6図参照)

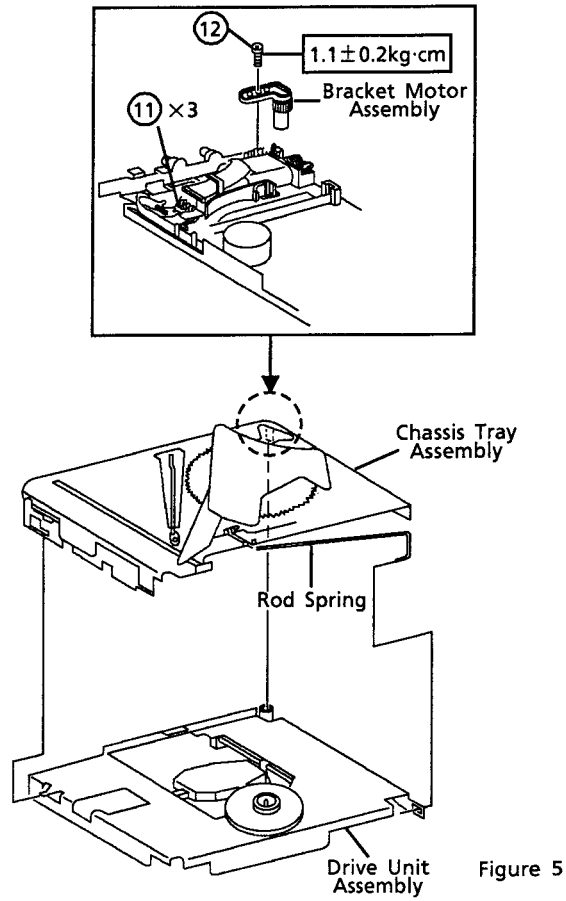


Figure 5

9. Removal of Sled Motor

(1) Remove the two solders (15) as shown in Figure 7.
(2) Remove the Middle Gear, by removing the washer (16) as shown in Figure 7.
(3) Remove the two screws (17) as shown in Figure 7.

9. スレッドモーターの外し方

(1) 2箇所の半田(15)を外します。(7図参照)
(2) 1個のワッシャー(16)を外して，ミドルギアを外します。(7図参照)
(3) 2本のネジ(17)を外します。(7図参照)

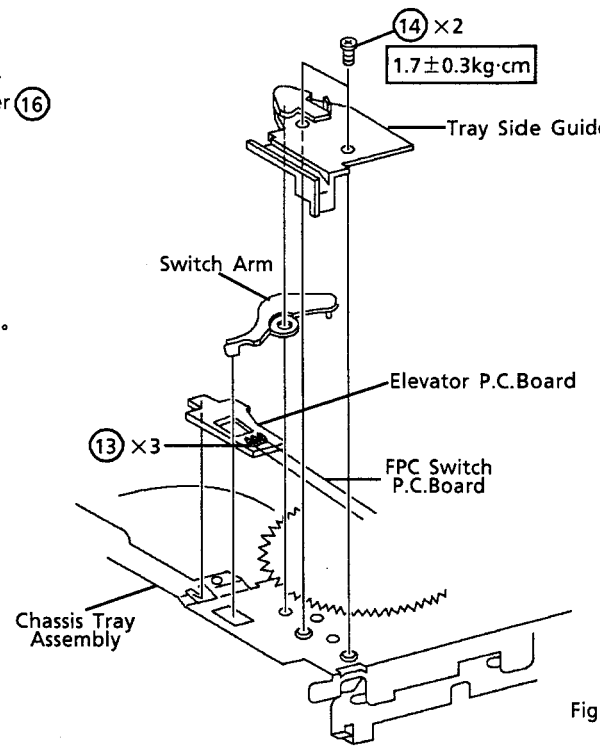


Figure 6

10. Removal of Loading Motor

(1) Remove the two solders (18) as shown in Figure 7.
(2) Remove the two screws (19) as shown in Figure 7.

10. ローディングモーターの外し方

(1) 2箇所の半田 (18) を外します。(7図参照)
(2) 2本のネジ (19) を外します。(7図参照)

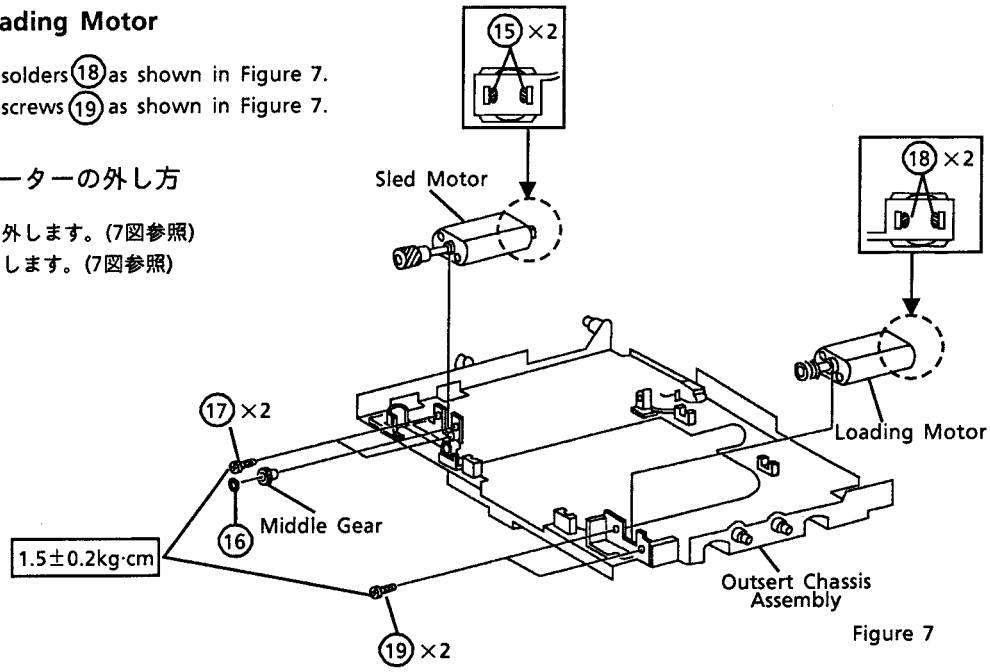


Figure 7

11. Removal of Pick Up Unit

(1) Remove the four solders (20) as shown in Figure 9.
(2) Remove the Shaft Stopper (A) / (B), by removing the two screws (21) as shown in Figure 8.
(3) Remove the two Shafts as shown in Figure 8.

11. プックアップユニットの外し方

(1) 4箇所の半田 (20) を外します。(9図参照)
(2) 2本のネジ (21) を外して, シャフトストッパー(A) / (B)を外します。(8図参照)
(3) 2本のシャフトを引き抜きます。(8図参照)

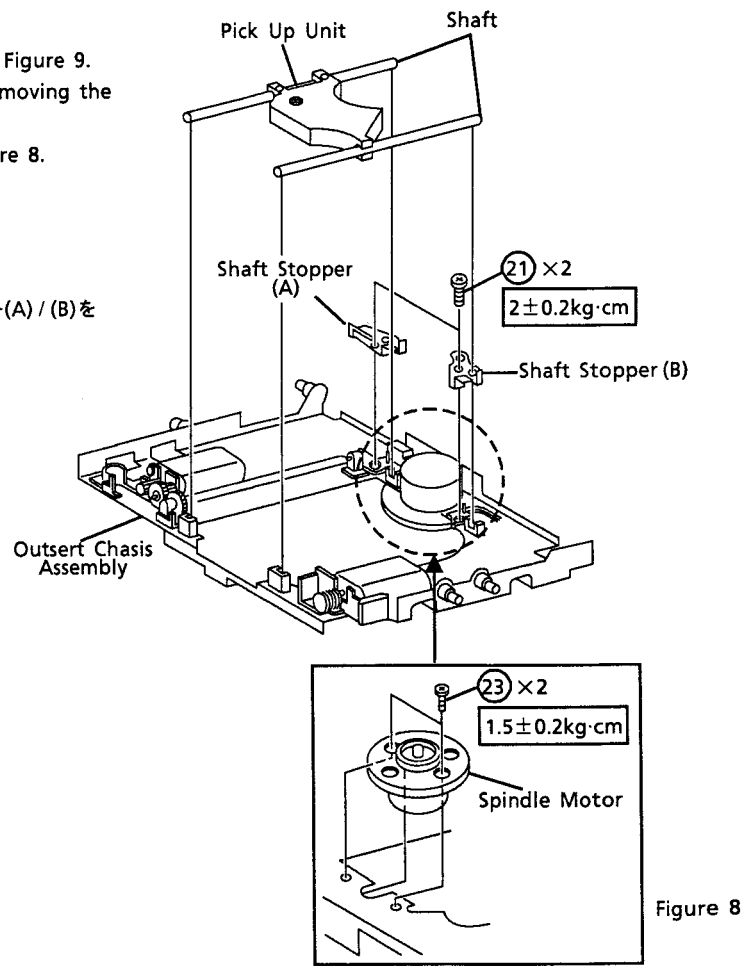


Figure 8

12. Removal of Spindle Motor

(1) Disconnect the RED and BLK wires, by removing the two solders (22) as shown in Figure 9.
(2) Remove two screws (23) as shown in Figure 8.

12. スピンドルモーターの外し方

(1) 2箇所の半田(22)を外して，赤 / 黒のワイヤーを外します。(9図参照)
(2) 2本のネジ(23)を外します。(8図参照)

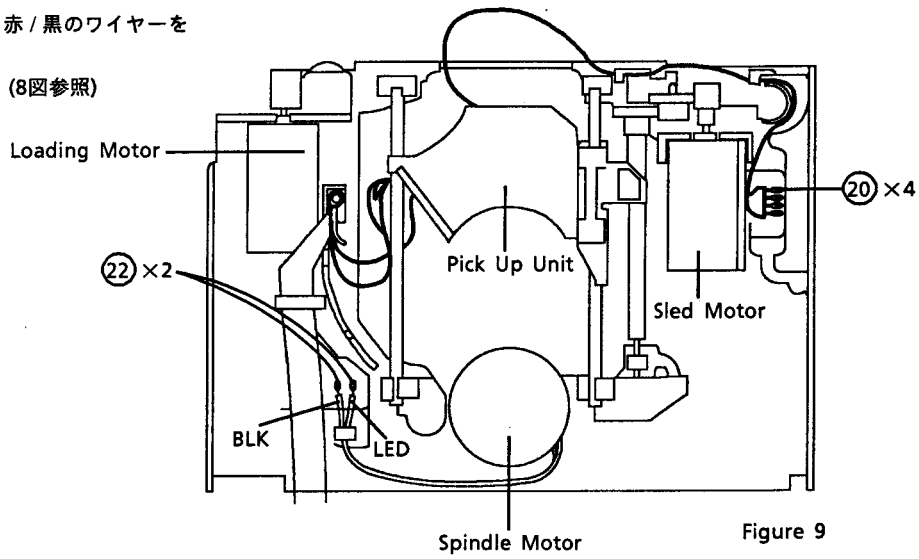


Figure 9

Mechanism Function Description

● Magazine Insertion

Step	Description	Illustration
1	When a magazine is inserted, the eject lever is pushed in.	Figure 10
2	Further insertion of the magazine causes the magazine lock arm to move.	
3	The magazine lock arm causes the magazine to lock. At the same time the thrust magazine switch is pushed and the magazine switch is turned off. (Confirmation of the magazine lock.)	

● マガジン挿入

順序	動 作 説 明	イラスト
1	マガジンを挿入するとイジェクト･レバーが押される。	10図
2	更に挿入するとマガジン･ロック･アームが動く。	
3	マガジン･ロック･アームによりマガジンがロックされ、同時にスライド･マガジン･スイッチが押されマガジン･スイッチがOFFする。(マガジンがロックされたことの確認)	

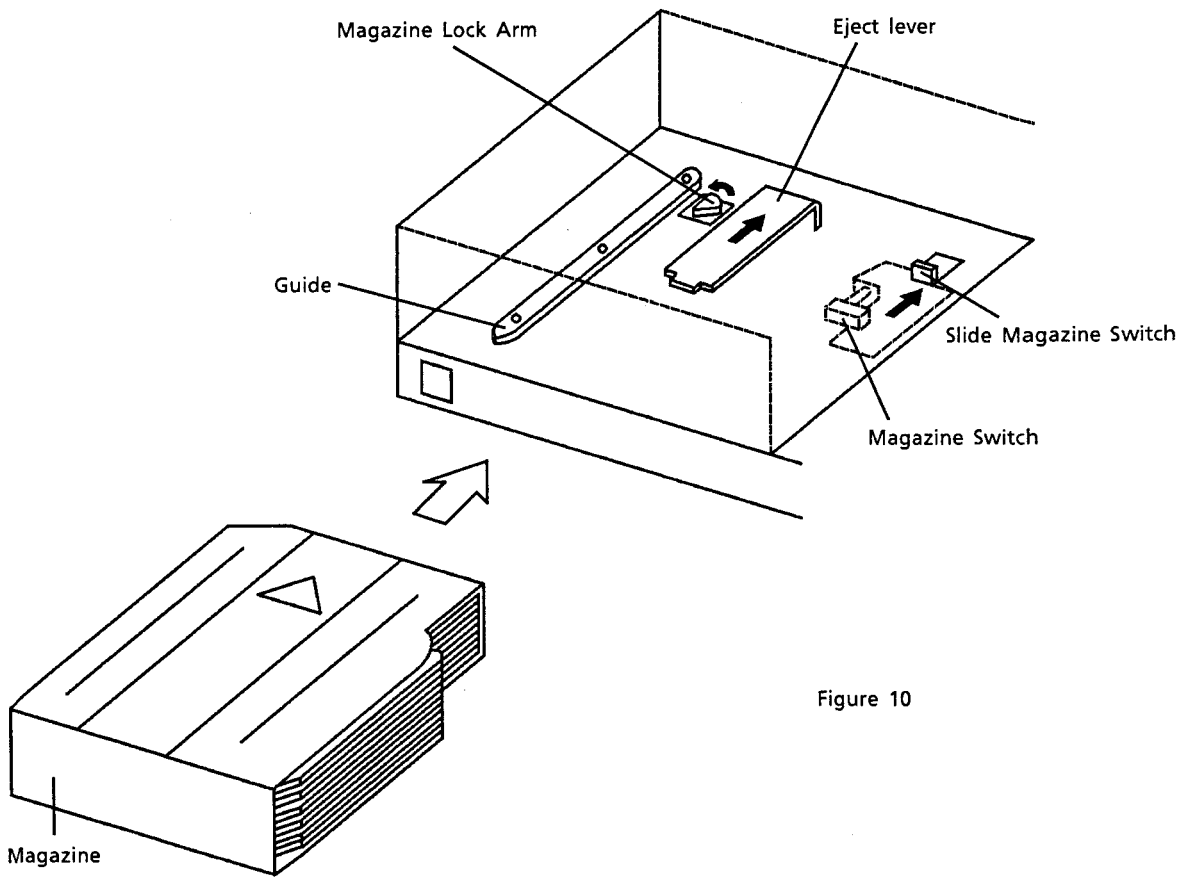


Figure 10

● DISC Loading

Step	Description	Illustration
1	The elevator motor rotates.	Figure 11
2	The rotation is transmitted to gears (A), (B), (C), and (D).	
3	The rotation of the gear (D) moves the slider cam (A) in Y direction and the slider cam (B) in X direction. Then, the chassis tray and the drive unit move in Q direction along to edges of the cams.	
4	Motion of the bracket sensor in X, Y directions moves the position sensor volume, thereby controlling movement distances of the chassis tray and the drive unit.	
5	The chassis is stopped at the first disc position in the magazine. (This operation is the same for 2nd through 6th discs except the movement distance of the chassis is different.)	
6	The loading motor rotates. (The loading motor can rotate in forward and reverse directions.)	
7	The rotation is transmitted to gears (E), (F), (G) and (H).	
8	The rotation of the gear (H) moves the arm push-pull in Y direction through the lever cam and takes out the tray from the magazine.	
9	In the same way as in the step (8), the rotation of gear (H) moves the slider lock claw at side of the chassis tray through the lover slider lock and engages it with the slit provided on the chassis frame, thus locking the chassis tray.	
10	In the same way as in the step (9), the rotation of gear (H) turns on the switch A through the arm switch. (Confirmation of the tray pulled into the chassis tray.)	
11	Steps 1 - 4 (step 3 for only the drive unit) are repeated again to bring the drive unit in the disc play position and then the disc is clamped by pressing the disc to the clamper.	

● DISC ローディング

順序	動 作 説 明	イラスト
1	エレベーター･モーターが回転する。	11図
2	ギア (A), (B), (C), (D)と動力が伝達する。	
3	ギア (D) の動力によりスライダー･カム (A) がY方向、スライダー･カム (B) がX方向に動き、カムのプロフィールに沿ってシャーシ･トレイ及びドライブ･ユニットがQ方向に動く。	
4	ブラケット･センサーがX, Y方向に動くことによって、ポジションセンサー･ボリュームを動かし、シャーシ･トレイ及びドライブ･ユニットの移動距離を制御する。	
5	マガジンの1枚目のトレイ位置にシャーシ･トレイを止める。(2~6枚目のトレイはシャーシ･トレイ停止位置が異なるだけで、動作は同様)	
6	ローディング･モーターが回転する。(正逆転可能)	
7	ギア (E), (F), (G), (H) と回転が伝達する。	

順序	動 作 説 明	イラスト
8	ギア (H) の回転動力によりレバー·カムを介し、アーム·プッシュプルをY方向に動かし、マガジンからトレイを引き出す。	11図
9	項目8と同時に、ギア (H) の回転動力により、レバー·スライダー·ロックを介し、シャーシ·トレイの側面にあるスライダー·ロックの爪が動きシャーシ·フレームのスリット穴と勘合され、シャーシ·トレイがロックされる。	
10	項目9と同時に、ギア (H) の回転動力により、アーム·スイッチを介し、スイッチ (A) がONする。(トレイがシャーシ·トレイに引き込まれたことの確認)	
11	再び項目1~4の動作(項目3はドライブ·ユニットのみ)を行い、DISCプレイ位置にドライブ·ユニットを動かすことによって、DISCをクランパーに押しつけてDISCをクランプする。	

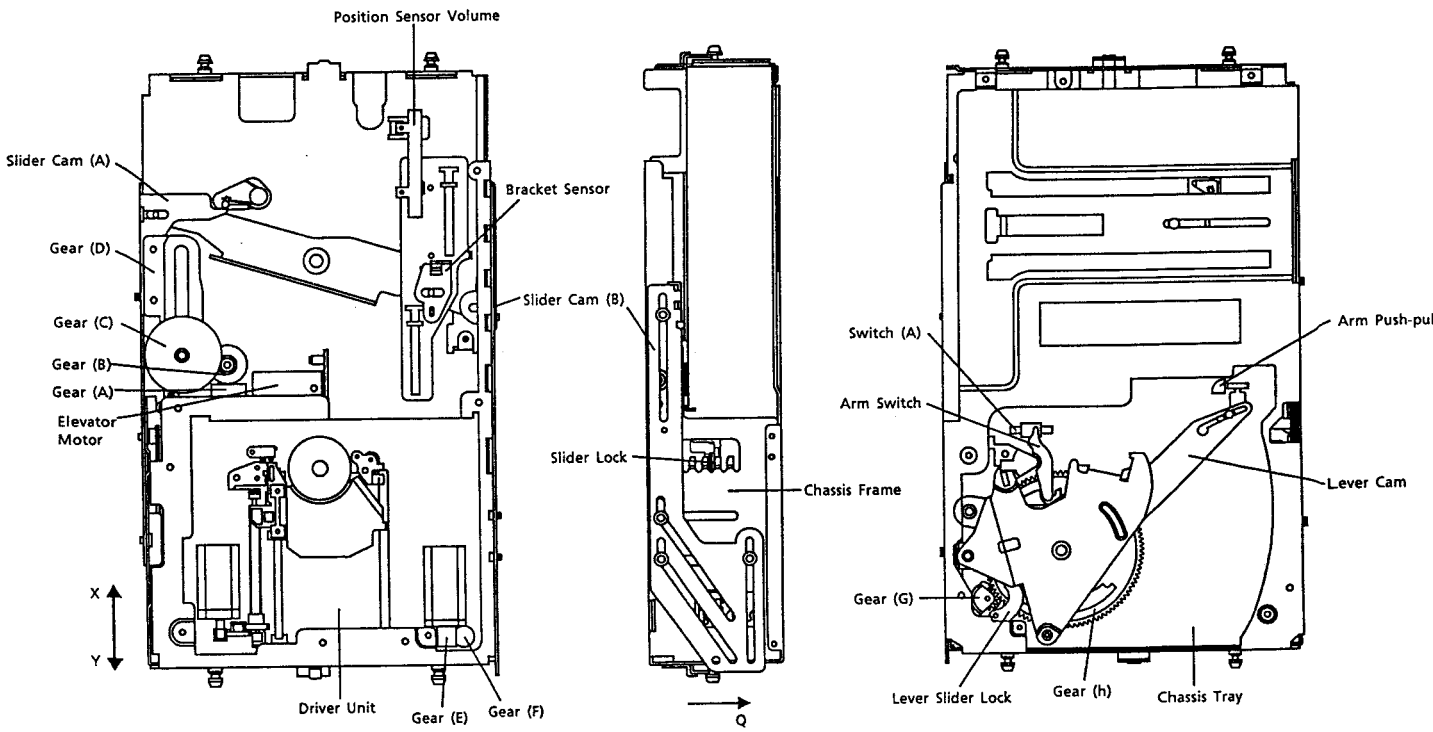


Figure 11

● Play

Step	Description	Illustration
1	The spindle motor rotates.	Figure 12
2	The rotation of the sled motor is transmitted through the gears to the feed screw and moves the pickup.	
3	The lead-in position of the disc is detected by the inner limit position switch and the reading of the disc data begins.	

● プレイ

順序	動 作 説 明	イラスト
1	スピンドル·モーターが回転する。	12図
2	スレッド·モーターの回転がギア (I), (J)を介して送りスクリューに伝えられ、ピック·アップを移動させる。	
3	内周リミットスイッチにより、DISCのリードイン位置を検知し、DISCの情報を読み始める。	

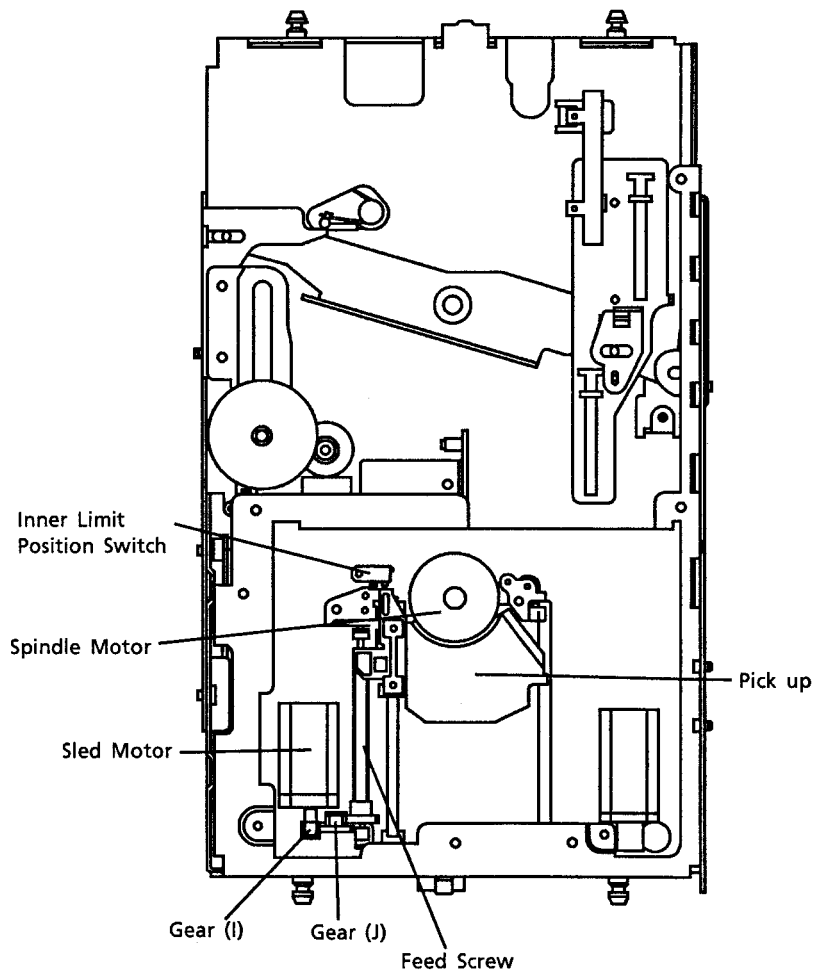


Figure 12

● Disc Unloading

Step	Description	Illustration
1	The elevator motor rotates.	Figure 13
2	The rotation of the motor is transmitted to gears (A), (B), (C), and (D).	
3	The rotation of the gear (D) moves the slider cam (A) in X direction and the slider cam (B) in Y direction, and the drive unit moves along to the edges of the cams, thereby releasing the disc clamp.	
4	The loading motor rotates.	
5	The rotation of the motor is transmitted to gears (E), (F), (G), and (H).	
6	The rotation of gear (H) is transmitted to the arm push-pull through the lever cam and this moves the arm push-pull in X direction, thereby housing the tray into the magazine.	
7	In the same way as in step (6), the rotation of the gear (H) moves the slider lock through the lever slider lock and releases the lock of the chassis tray.	
8	In the same way as in step (7), the rotation of the gear (H) turns on the switch (B) through the arm switch. (Confirmation of the tray housed in the magazine.)	

● DISC アンローディング

順序	動 作 説 明	イラスト
1	エレベーター･モーターが回転する。	13 図
2	ギア(A), (B), (C), (D)と動力が伝達する。	
3	ギア(D)の動力により、スライダー･カム(A)がX方向、スライダー･カム(B)がY方向に動き、カムのプロフィールに沿ってドライブ･ユニットがP方向に動きDISCクランプを解除する。	
4	ローディング･モーターが回転する。	
5	ギア(E), (F), (G), (H)と回転が伝達する。	
6	ギア(H)の回転動力によりレバー･カムを介し、アーム･プッシュ･プルをX方向に動かし、トレイをマガジンに収納する。	
7	項目6と同時に、ギア(H)の回転動力により、レバー･スライダー･ロックを介し、スライダー･ロックを動かし、シャーシ･トレイのロックを解除する。	
8	項目7と同時に、ギア(H)の回転動力により、アーム･スイッチを介し、スイッチ(B)がONする。(トレイが、マガジンに収納されたことの確認)	

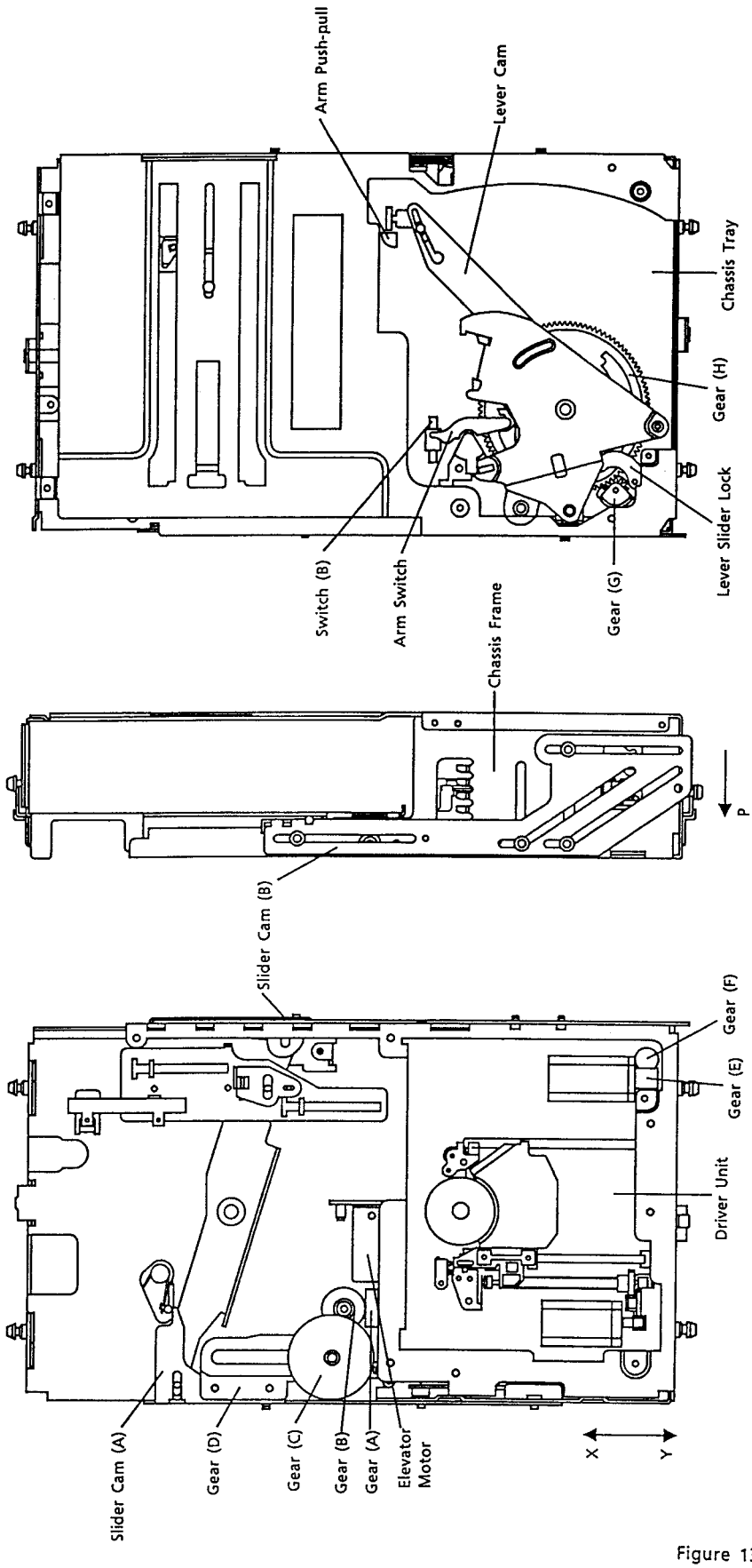

Arm Push-pull
Lever Cam
Chassis Tray
Gear (H)
Lever Slider Lock
Switch (B)
Arm Switch
Gear (G)
Chassis Frame
P
Slider Cam (B)
Gear (F)
Gear (E)
Driver Unit
Slider Cam (A)
Gear (D)
Gear (C)
Gear (B)
Gear (A)
Elevator Motor
X
Y

Figure 13

● Magazine Eject

Step	Description	Illustration
1	The elevator motor rotates.	Figure 14
2	The rotation is transmitted to gears (A), (B), (C), and (D).	
3	The rotation of the gear (D) moves the slider cam (A) in X direction, and pushes the magazine lock arm, thereby releasing the magazine lock.	
4	The force of the spring moves the eject lever in R direction and this ejects the magazine and turns on the magazine switch. (Confirmation of the magazine ejected.)	

● DISC イジェクト

順序	動 作 説 明	イラスト
1	エレベーター·モーターが回転する。	14図
2	ギア(A), (B), (C), (D)と動力が伝達する。	
3	ギア(D)の動力により、スライダー·カム(A)がX方向に動きマガジン·ロック·アームを押し、マガジン·ロックが解除される。	
4	イジェクト·レバーがバネの力によりR方向に動きマガジンが排出され、マガジン·スイッチがONする。(マガジンを排出したことの確認)	

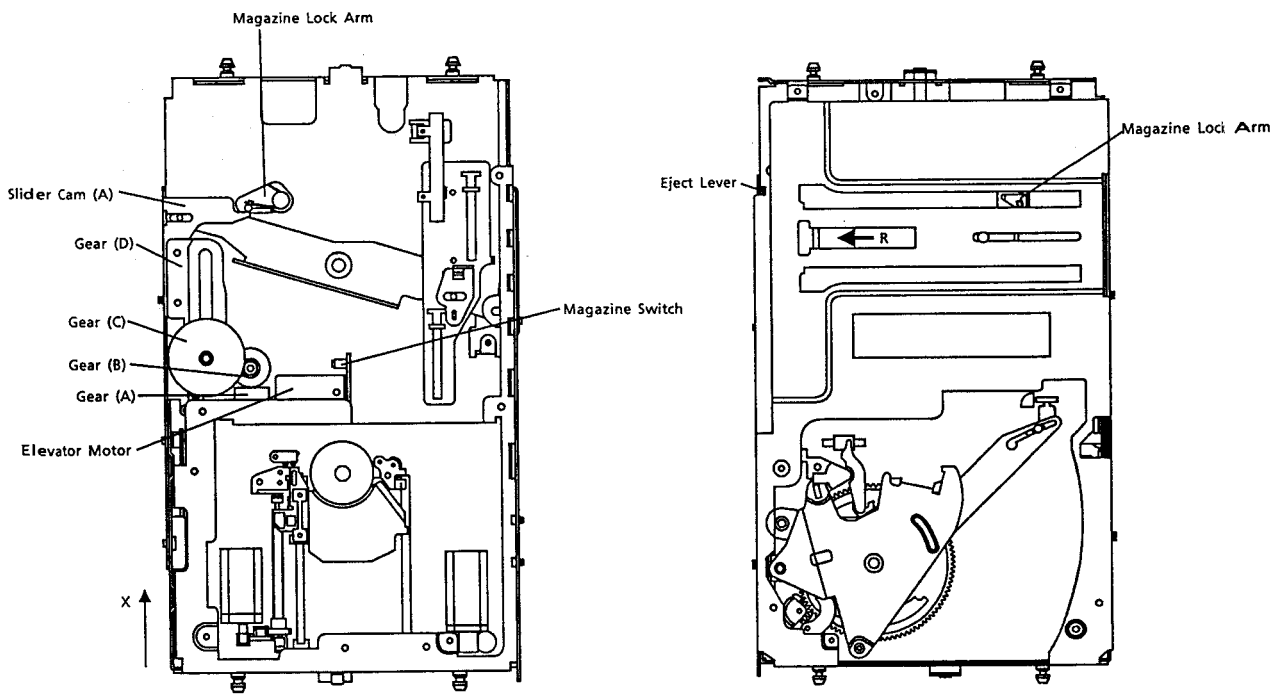


Figure 14

Timing Chart

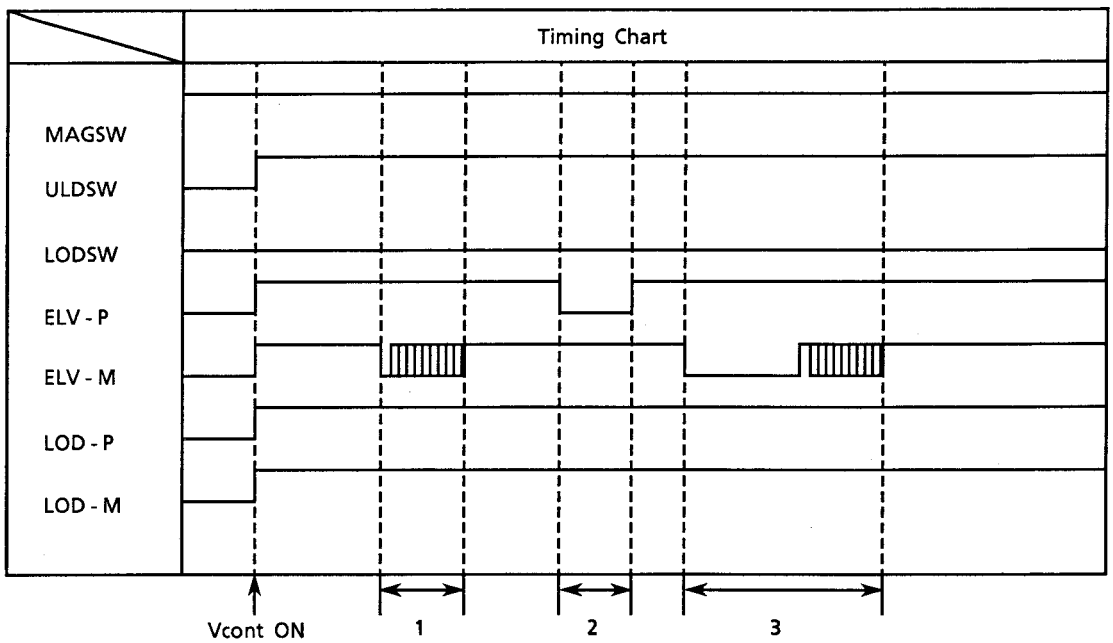
● Initialization (イニシャライズ動作)

Carried out when the unit is reset.

1. A blank eject operation is carried out when a magazine is not installed.
2. If the tray is pulled in (LODSW=L), one of two operations shown below is carried out.
   a. If the address is remembered in the EEPROM, nothing is carried out with the current conditions maintained.
   b. If the EEPROM does not exist, the address is identified by making a forced chucking.

リセットがかかった時に行う動作

1. マガジンなしの場合は、空イジェクト動作をする。
2. トレイを引き込んでいる場合 (LODSW=L) は、次の2つの場合がある。
   a. EEPROM で番地を覚えている場合は、そのまま何もしない。
   b. EEPROM がない場合は、強制チャッキングで番地を判断する。



Process contents

1	Forced chucking	When ULDSW is H and LODSW is L, the unit is in loading status, but chucking status is not judged with LPS only. So, forced chucking is carried out by moving the elevator upward with pulse signal for 3 seconds.
2	Releasing	Releases the chucking by moving the elevator downward. Microcomputer confirms a value of the linear position sensor and judges the disc position.
3	Chucking	As MAGSW is H, the mechanism chucks a disc, reads TOC, stops, and then waits commands from bus.
		* Condition to carry out the forced chucking : Unit without EEPROM is reset.

処理内容

1	強制 チャッキング	ULDSWがHでLODSWがLのときは、ローディングされている状態だが、チャッキングされているか否かは、LPSだけでは判断できない為、エレベーターを上方に3秒間パルス送りして強制的にチャッキングさせる。
2	リリース	エレベータを下方に移動させ、リリース(チャッキングを外す) μ-COMがリニアポジションセンサーの値を確認して、何枚目のポジションであるかを判断する。
3	チャッキング	MAGSWがHである為、ディスクをチャッキングしてTOCを読みSTOPしてからパスのコマンドを待つ。
		* 強制チャッキングを行う条件としては: EEPROMがなくてRESETがかかった場合。

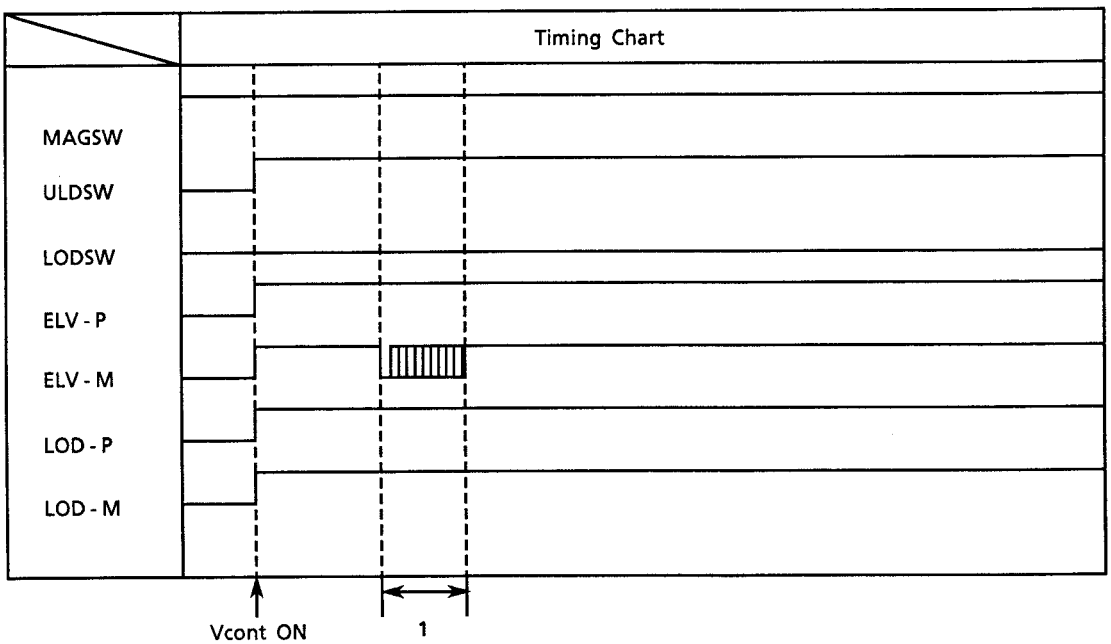
● Pressing operation (押し付け動作)

Pressing operation is carried out to perform precise chucking.

1. This operation is carried out when an operation mode is changed from Tape / Tuner to CD with the ACC / Power on after the reset.

正確にチャッキングするように押し付ける動作

1. リセット後にACC / POWERのONし、テープ / チューナーからCDになった時に行う。



Process contents

1	Pressing operation	As ULDSW is H and LODSW is L, a disc loaded is confirmed and the elevator is moved with pulse signal.
		* Pressing operation is an operation to remove a loosening.

処理内容

1	押し付け動作	ULDSWがH、LODSWがLであるためディスクがローディングさてれいることを確認して、エレベータをパルス送りにて移動させる。
		* 押し付け動作とは、緩みを取る為に行う動作をいう。

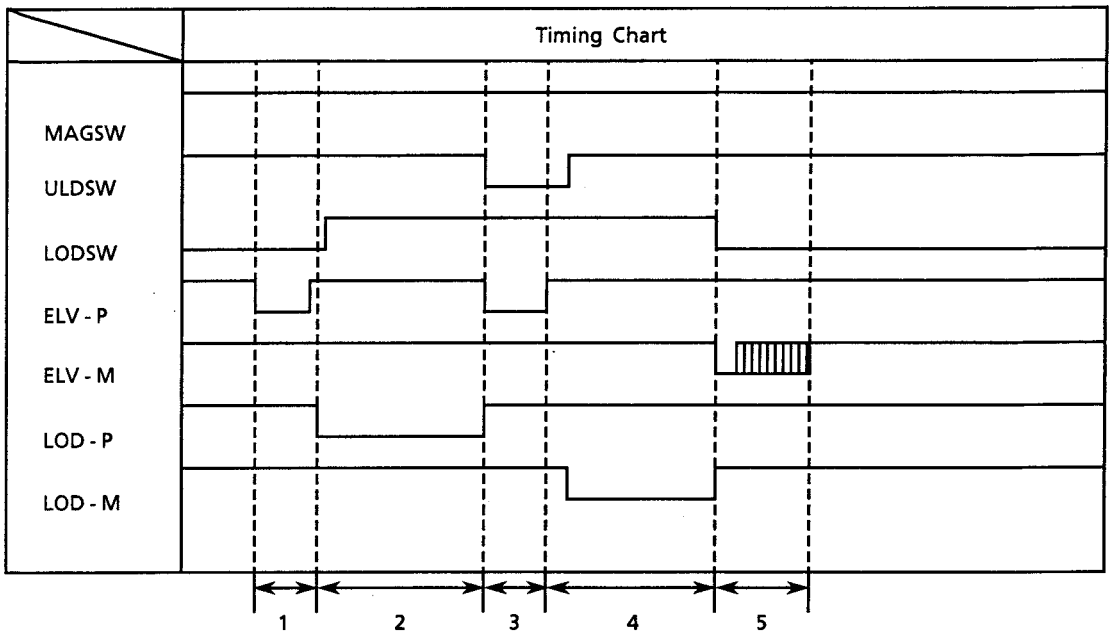
● Disc change operation (Example in downward operation) (ディスクチェンジ動作 (下向きの例))

Disc change operation from Mth disc to Nth disc.

1. Mth disc is released (MP→MT), unloading is carried out, and the elevator is moved (MT→NT), and then the loading and chucking operations are carried out (NT→MT).

M枚目からN枚目にDISCチェンジをする動作

1. M枚目をリリース (MP→MT) し、アンロードを行いエレベータを移動 (MT→NT) させローディ グ、チャッキング (NT→NP) する。



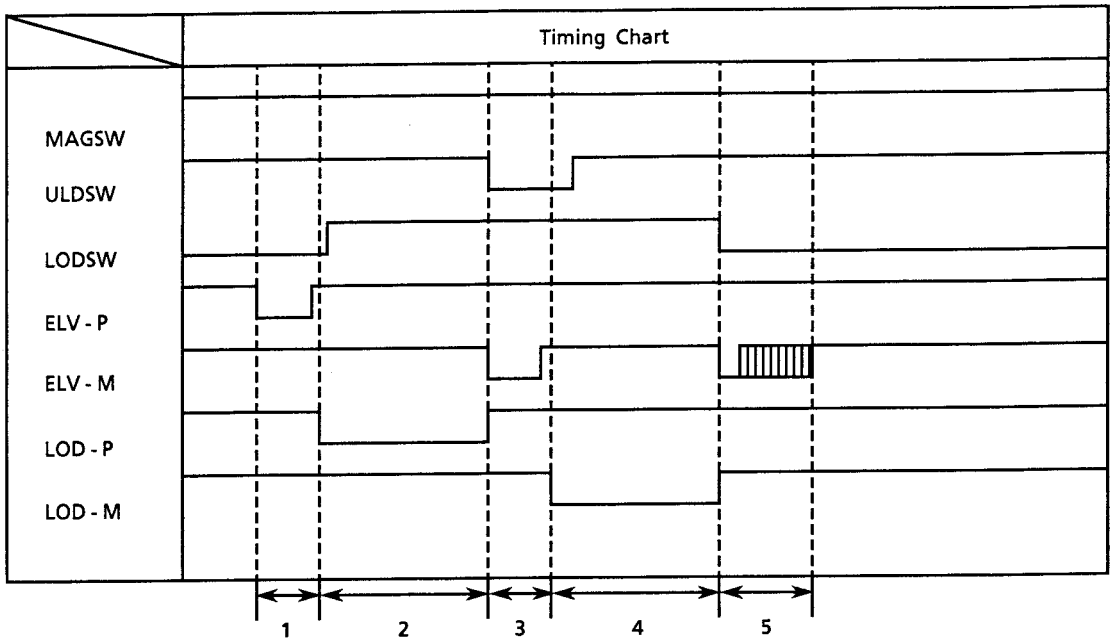
Process contents

1	Releasing	Moves the elevator downward and releases the chucking.
2	Unloading	Returns the disc to the tray. In this case, the operation completes at a falling edge of ULDSW [H→L (OFF→ON)].
3	Elevator downward	Moves the elevator downward and stops it when it reaches a predetermined pull-in position.
4	Loading	Pulls out the tray from the magazine. This operation completes when LODSW goes L (ON).
5	Chucking	Moves the elevator upward and chucks a disc. In this case, a final pulse is fed to make the chucking securely.

処理内容

1	リリース	エレベータを下方に移動させチャッキングを外す。
2	アンロード	ディスクをトレイに戻す。この時ULDSWの立ち下がり[H→L (OFF→ON)] をもって動作終了となる。
3	エレベータ下向き	エレベータを下方に移動させ、目的の引き込み位置まで移動した時点で STOPする。
4	ローディング	マガジンよりトレイを引き出す。LODSWがL (ON) になった時点で動作終了となる。
5	チャッキング	エレベータを上方に移動させ、チャッキングする。この際、最後にパルス送りで確実にチャッキングさせる。

● Disc change operation (Upward) (ディスクチェンジ動作 (上向きの例))



Process contents

1	Releasing	Moved the elevator downward and releases the chucking.
2	Unloading	Returns the disc to the tray. In this case, the operation completes at the falling edge of ULDSW [H→L (OFF→ON)].
3	Elevator downward	Moves the elevator upward and stops it when it reaches a predetermined pull-in position.
4	Loading	Takes out the tray from the magazine. Completes the operation when LODSW goes L (ON).
5	Chucking	Moves the elevator upward and chucks a disc. In this case, a final pulse is fed to make the chucking securely.

処理内容

1	リリース	エレベータを下方に移動させチャッキングを外す。
2	アンロード	ディスクをトレイに戻す。この時ULDSWの立ち下がり[H→L (OFF→ON)]をもって動作終了となる。
3	エレベータ下向き	エレベータを上方に移動させ、目的の引き込み位置まで移動した時点でSTOPする。
4	ローディング	マガジンよりトレイを引き出す。LODSWがL (ON) になった時点で動作終了となる。
5	チャッキング	エレベータを上方に移動させ、チャッキングする。この際、最後にパルス送りで確実にチャッキングさせる。

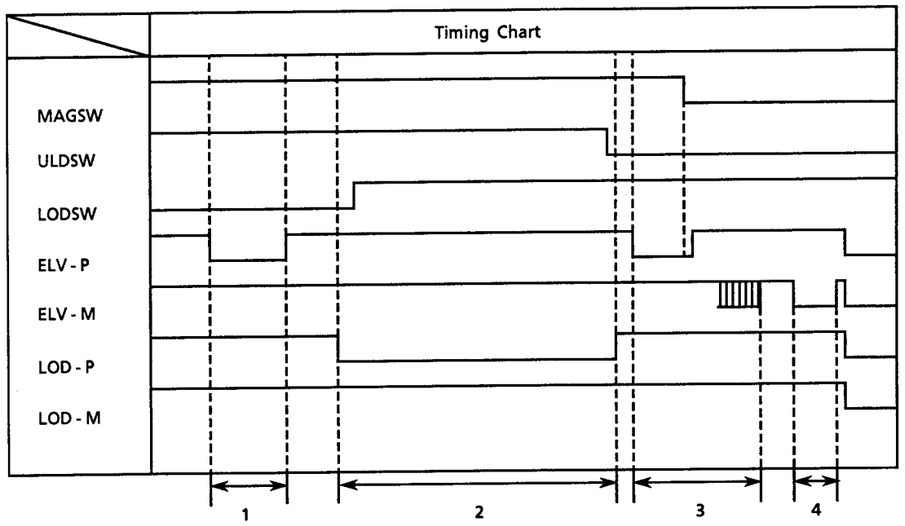
● Eject operation (イジェクト動作)

Operation to reject the magazine

1. Releases Mth disc (MP→MT), performs unloading, moves the elevator (MT→E) to release the lock, moves the elevator (E→2T), and then enters the standby condition.

マガジンをイジェクトする動作

1. M枚目をリリース (MP→MT))し、アンロード後エレベータを移動 (MT→E) してロックを外し、エレベータを移動 (E→2T) して待機状態になる。



Process contents

1	Releasing	Moved the elevator downward and releases the chucking.
2	Unloading	With ULDSW=H, LODSW=L the tray is in a loading status, so unloading operation is carried out. When ULDSW changes from H to L, LODM is stopped.
3	Eject	Moves the elevator downward and lowers it up to the eject position. Releases the magazine lock and confirms MAGSW. In this case, if MAGSW=L, the elevator is moved up to 1T position with a pulse signal.
4	Elevator shift	The elevator is moved to 1t position, and then moved to 2T position, and then eject operation completes. (Standby status)

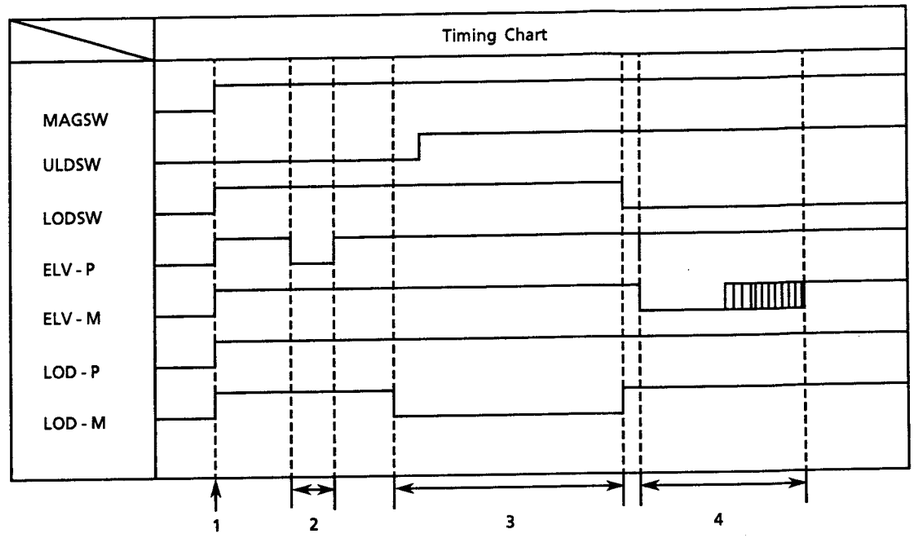
処理内容

1	リリース	エレベータを下方に移動させチャッキングを外す。
2	アンロード	ULDSWがH, LODSWがL の時にはトレイがローディングされている状態なので、アンローディング動作を行う。ULDSWが H→L となるとLODMをストップさせる。
3	イジェクト	エレベータを下方に移動させ、イジェクト位置まで下降させる。ここでマガジンロックを解除し、MAGSWを確認する。この時MAGSWがL の場合にはエレベーターを1Tの位置までパルス送りで移動させる。
4	エレベータ移動	エレベータが1Tの位置まで移動した後、エレベーターは2Tの位置まで移動しイジェクト動作が終了する。(スタンバイ状態)

● Magazine insertion operation (マガジン挿入時の動作)

1. When a magazine is inserted, first disc is pulled-in and chucked.

1. マガジンが挿入されたときは、1枚目を引き込んでチャッキングする。



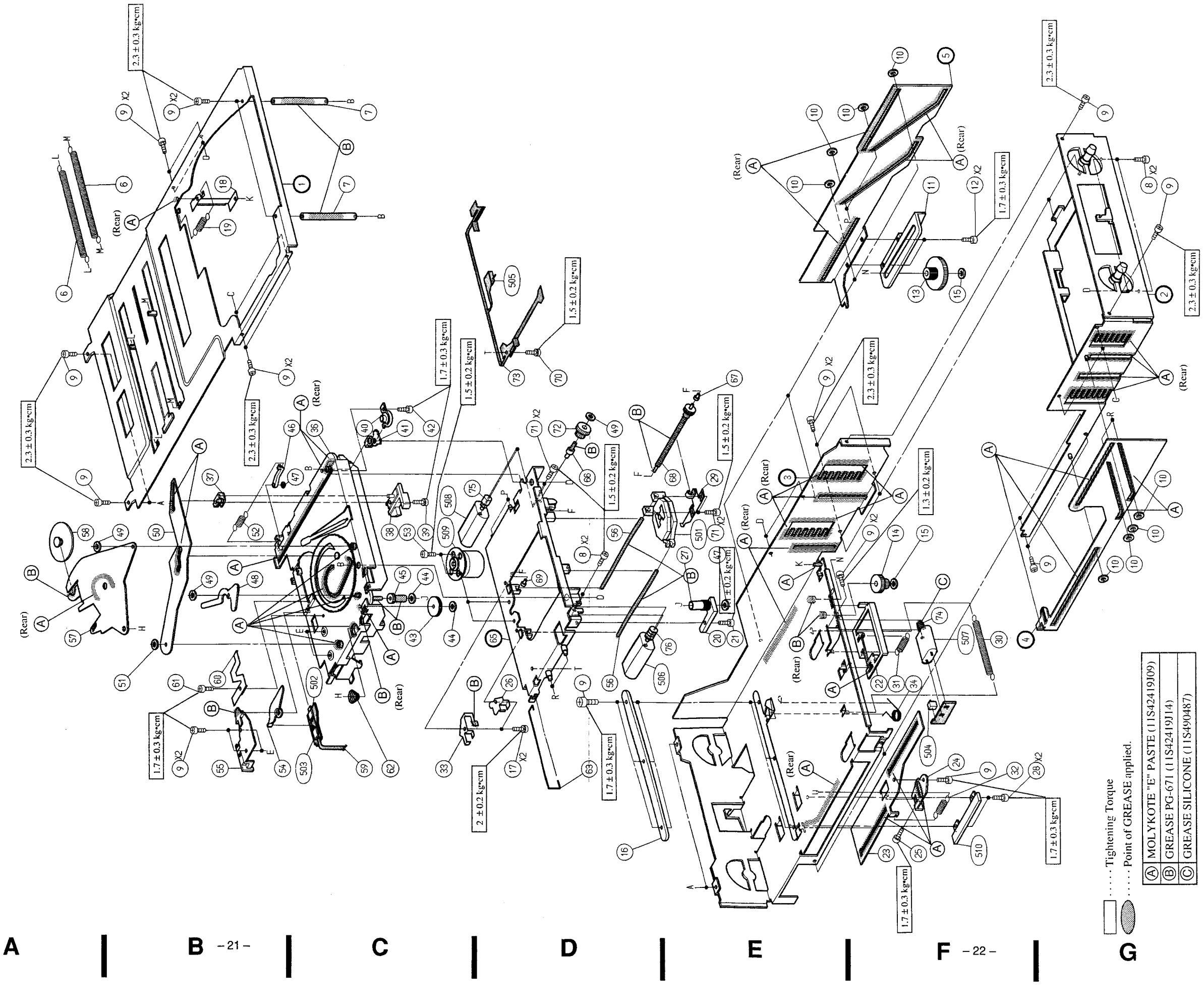
Process contents

1	Magazine insertion	When the magazine is inserted, MAGSW goes H.
2	Elevator shift	First, the elevator moves downward and moves to a specified pull-in position.
3	Loading	The loading motor rotates in forward and pulls in the tray. This makes LODSW to H, and the loading operation completes when LODSW shows L.
4	Chucking	The chucking operation completes by making ELV-M to L and feeding the elevator with the pulse signal and if the value of LPS is within a specified value.

処理内容

1	マガジン挿入	マガジンが挿入されると、MAGSWがHとなります。
2	エレベータ移動	最初にエレベータが下方に移動して、目的の引き込み位置へ移動する。
3	ローディング	ローディングモータを正転させ、トレイを引き込む。これによりLODSWがHになり、LODSWがLになった時点でローディングを終了する。
4	チャッキング	チャッキング動作は、ELV-MをLにして、エレベータをパルス送りにてLPSの値が規定値内であれば動作を終了する。

Exploded View (CD Mechanism) ● DT24A010


2.3 ± 0.3 kg•cm
1.7 ± 0.3 kg•cm
1.5 ± 0.2 kg•cm
1.3 ± 0.2 kg•cm
2 ± 0.2 kg•cm
(Rear)
(Reur)
· · · · · Tightening Torque
· · · · · Point of GREASE applied.
Ⓐ MOLYKOTE "E" PASTE (1IS42419J09)
Ⓑ GREASE PG-671 (1IS42419J14)
Ⓒ GREASE SILICONE (1IS4490487)

CD Mechanism Assembly Parts List

Note : No parts number on parts list are not supplied.

Symbol No.	Index	Part No.	Description
6		41B51993W01	Spring, Extension
7		47A51917W01	Shaft, Guide
8		03S94385F09	Screw, Pan (M2×3)
9		03S94385F19	Screw, Pan (M2×2.5)
10		04B41345P22	Washer, Lock (M2.6)
11	2-F	44B51886W01	Rack, Elevator
12	2-F	03S40014G07	Screw, W/Washer (M2×4)
13	2-F	44A60088W01	Gear, Rack
14	3-F	44A60089W01	Gear, Wheel
15		04B41345P06	Washer, Lock (M2.1)
16	5-D	15A51889W01	Guide, Magagine
17	5-D	03S40014G66	Screw, W/Washer (M2×3.5)
18	2-B	45A51880W01	Stopper, Tray
19	2-B	41B51993W02	Spring, Extension
20	4-E	45A60160W01	Spacer, Bracket Motor
21	4-E	03S70494F12	Screw, Pan (M2×8)
22	4-F	45A51874W01	Slide, Magazine Switch
23	5-F	45A51870W01	Slide, Sensor
24	4-F	07A51882W01	Bracket, Sensor
25	5-F	03S94385F11	Screw, Pan (M2×5)
26	4-D	07A60168W01	Stopper, Shaft (B)
27	5-F	44A52035W01	Gear, Drive
28	4-F	03S94385F28	Screw, Pan (M1.7×2)
29	3-E	41A60159W01	Spring, Nut
30	4-F	41B51993W03	Spring, Extension
31	4-F	41B51993W04	Spring, Extension
32	4-F	41B51993W05	Spring, Extension
33	5-C	07A60167W01	Stopper, Shaft (A)
34	4-F	41A51996W01	Spring, Torsion
36	3-C	01B51939W01	Assy., Riv. Chassis Tray
37	3-B	01A51932W01	Assy., Riv. Bracket Push Pull
38	3-C	45A51898W01	Arm, Push Pull
39	3-C	03S40014G61	Screw, W/Washer (M2×5)
40	3-C	15A51890W01	Guide, Chassis Tray
41	3-C	07A51884W01	Bracket, Corner
42	3-C	03S94385F10	Screw, Pan (M2×4)
43	4-C	44A52036W01	Gear, Cam
44	4-C	04B41345P15	Washer, Lock (M1.2)
45	4-C	44A51896W01	Gear, Driven
46	3-B	45A51894W01	Arm, Tray
47		04B41345P02	Washer, Lock (M1.7)
48	4-B	01A51937W01	Assy., Riv. Lever Slide
49		04B41345P12	Washer, Lock (M1.7)
50	3-B	45A52034W01	Lever, Cam
51	4-B	04B41345P04	Washer, Lock (M2.6)
52	3-B	41B51993W06	Spring, Extension
53	3-C	03S94385F01	Screw, Pan (M1.7×2.3)

Symbol No.	Index	Part No.	Description
54	5-B	45A51887W01	Arm, Switch
55	5-B	15B51891W01	Guide, Tray Side
56		47A60169W01	Shaft, Pickup
57	4-A	07B51879W01	Bracket, Clamper
58	3-A	43A50683W01	Table, Clamper
59	5-C	84T65057W01	FPC Switch P.C.Board
60	4-B	41A51872W01	Spring, Clamper
61	4-B	03S94385F06	Screw, Pan (M2×1.8)
62	5-C	41A51995W01	Spring, Compression
63	5-D	41A51923W01	Spring, Rod
66	3-D	46A60171W01	Stud, Middle
67	3-E	43A60164W01	Bush, Screw (A)
68	3-E	01V61300W99	Assy., Shaft Screw
69	4-D	43A60165W01	Bush, Screw (B)
70	3-D	03S40014G62	Screw, W/Washer (M2×3)
71		03S94385F18	Screw, Pan (M2×3.5)
72	3-D	44A60162W01	Gear, Middle
73	3-D	84T65058W01	FPC Drive P.C.Board
74	4-F	44A60151W01	Worm
75	3-D	44A60161W01	Gear, Motor
76	4-E	44A11281W01	Worm

Miscellaneous

501	3-E	88T55261W01	Pick Up Unit
502	4-C	40T35543W02	Switch, Detector (UNLOAD)
503	5-C	40T35543W02	Switch, Detector (LOADING)
504	5-F	40T15222W01	Switch, Detector (MAGAZINE IN)
505	2-D	40T71025F01	Switch, Detector (LIMIT)
506	4-E	59T65085W01	Motor, 7V-370mA (LOADING)
507	4-F	59T65085W01	Motor, 7V-370mA (SLED)
508	3-D	59T65085W01	Motor, 7V-370mA (ELEVATOR)
509	4-D	59T91005F03	Motor, 2V-215mA (SPINDLE)
510	5-F	18T55678W01	Volume, Slide RS32111 10K ohm

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ALPINE®

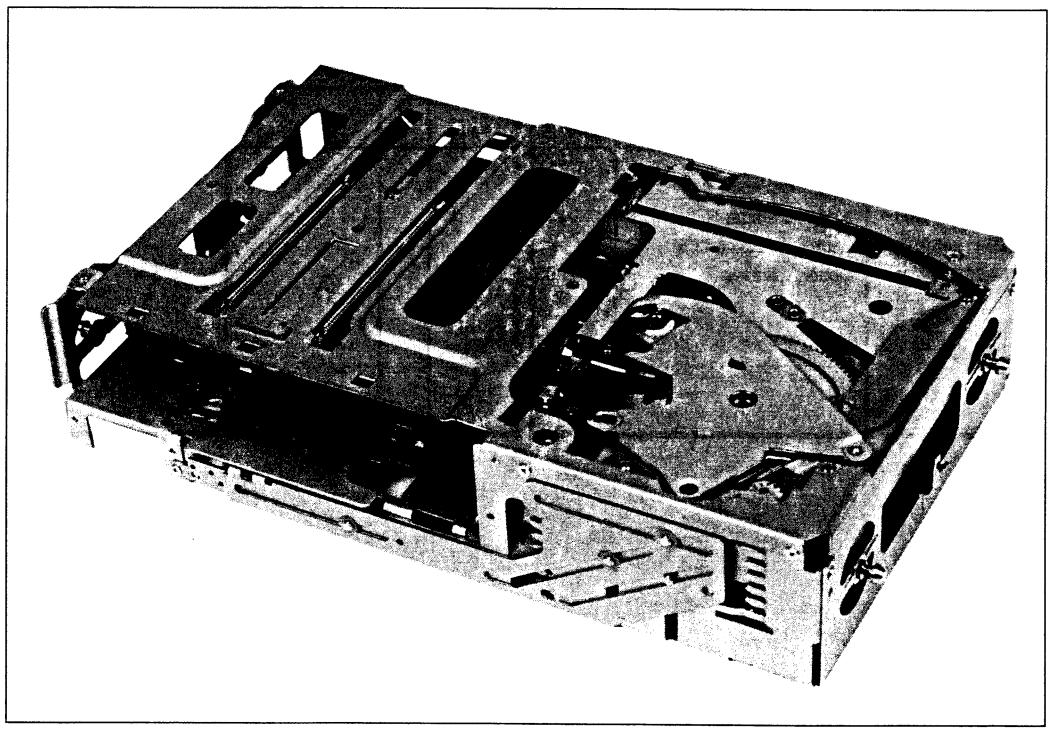
SERVICE MANUAL

CD Changer Mechanism

CD Shuttle

ADDENDUM & REVISED (II)

- This manual is described on DT24A030 only. The DT24A030 is developed from DT24A020. For information that is not mentioned in this service manual, refer to the Service Manual • DT SERIES (68E22617S01).
- 当マニュアルはDT24A030についてのみ記載しております。
  又、DT24A020がベースモデルとなっておりますので、相違部分のみ記載されてます。
  詳細についてはDTシリーズ (68E22617S01) を参照願います。



DT SERIES

Contents

CD Mechanism Assembly Parts List (Only Difference) 2
Exploded View (CD Mechanism) ..... 3 to 4

CD Mechanism Assembly Parts List

NOTE : For the parts not mentioned, refer to the Service Manual for DT SERIES (68E22617S01).

Symbol No.	Index	Part No.	Description
23	5-F	45A61305W01	Slide, Sensor
58	3-A	43A50683W01	Table, Clamper
or		43A80217W01	Table, Clamper-S
78	3-G	04B41345P05	Washer, Lock (M3.5)
79	1-C	75A80830W01	Rubber, Sleeve

Symbol No.	Index	Part No.	Description

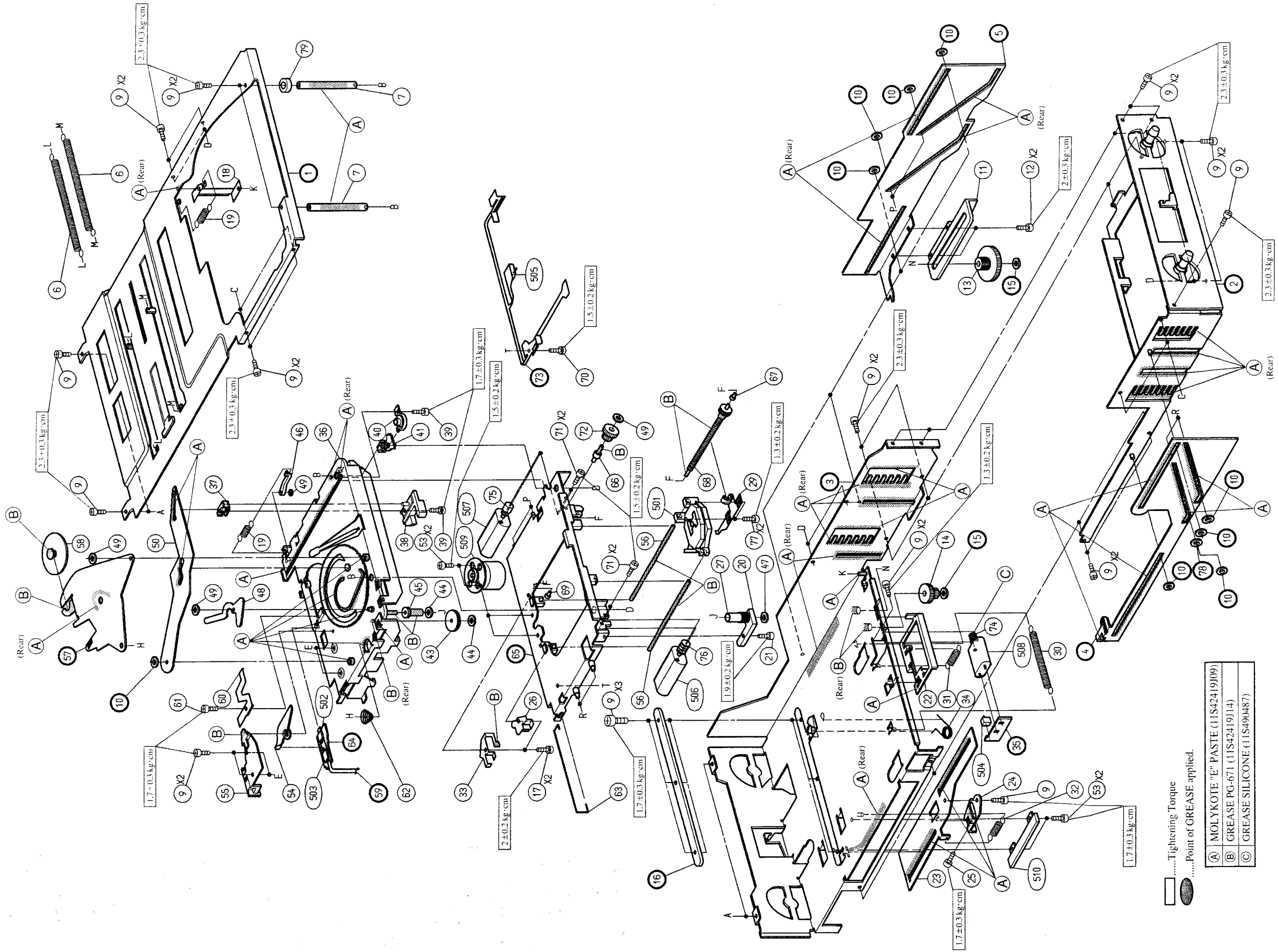
CDメカニズム関係部品表

※ 記載されていない部品については、サービスマニュアル・DT SERIES (68E22617S01) を参照願います。

記号	索引	部品番号	部品名	標準卸価格
23	5-F	45A61305W01	Slide, Sensor	230
58	3-A	43A50683W01	Table, Clamper	300
or		43A80217W01	Table, Clamper-S	230
78	3-G	04B41345P05	Washer, Lock (M3.5)	45
79	1-C	75A80830W01	Rubber, Sleeve	55

記号	索引	部品番号	部品名	標準卸価格

Exploded View (CD Mechanism) ● For DT24A030 Model



MEMO

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ALPINE®

SERVICE MANUAL

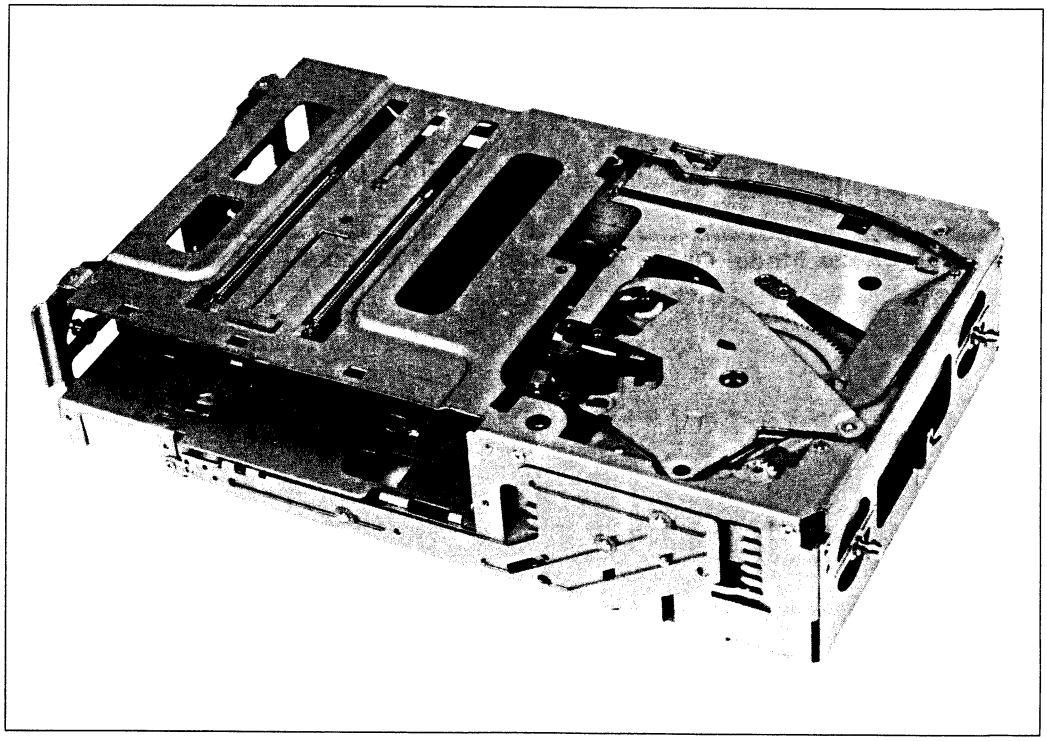
CD Changer Mechanism

CD Shuttle

ADDENDUM & REVISED

- This manual is described on DT24A01A/020 only. The DT24A01A/020 is developed from DT24A010.
  For information that is not mentioned in this service manual, refer to the Service Manual • DT SERIES (68P61023W01).

- 当マニュアルはDT24A01A/020についてのみ記載しております。
  又、DT24A010がベースモデルとなっておりますので、相違部分のみ記載されてます。
  詳細についてはDTシリーズ (68P61023W01) を参照願います。



DT SERIES

Contents

CD Mechanism Cabinet Assembly Parts List (Only Difference)..... 2
Exploded View (CD Mechanism)..... 3 to 4

Disassembly Instructions
Mechanism Function Description
Timing Chart
— Refer to the Service Manual for DT SERIES (68P61023W01).

CD Mechanism Cabinet Assembly Parts List

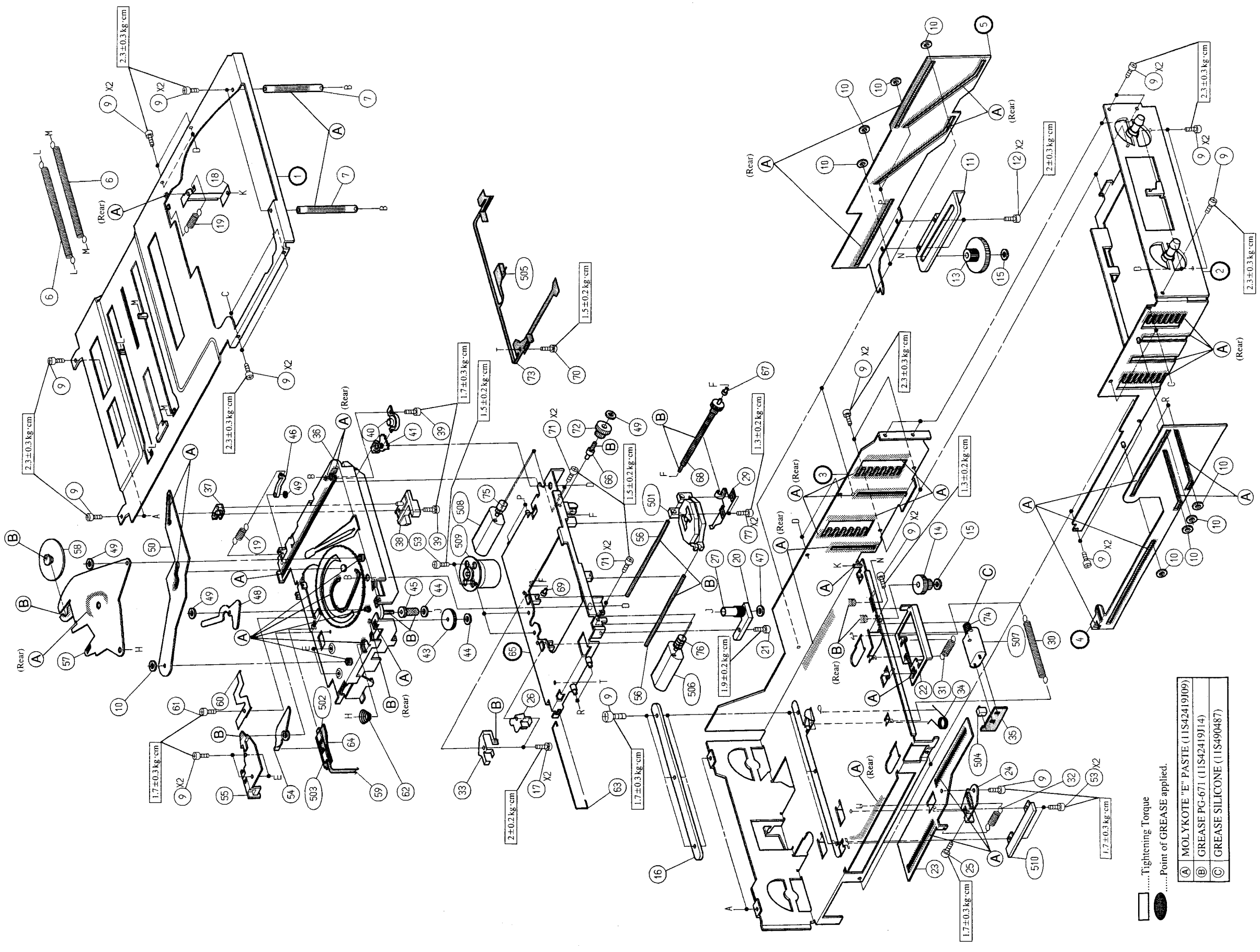
Note : For the parts not mentioned, refer to the Service Manual for DT SERIES (68P61023W01).

	Symbol No.	Index	Part No.	Description
	15		04B41345P24	Washer, Lock (M2.1)
	17	5-D	03D40121T56	Screw, W/Double Washer (M2×4)
○	23	5-F	45A61305W01	Slide, Sensor
△	23	5-F	45A51870W01	Slide, Sensor
	35	4-F	84D60153W01	Elevator P.C.Board
○	58	3-A	43A70026W01	Table, Clamper
△	58	3-A	43A50683W01	Table, Clamper
	64	4-C	84D60152W01	Switch P.C.Board
	76	4-E	44A70563W01	Worm
	77	3-E	03S94385F25	Screw, Pan (M2×3.5)

Symbol No.	Index	Part No.	Description

Notes : ○ : For DT24A01A Model Only, △ : For DT24A020 Model Only, Others : Common.

Exploded View (CD Mechanism) ● For DT24A01A/020 Models



DT SERIES

MEMO

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2 / 95-S
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ALPINE

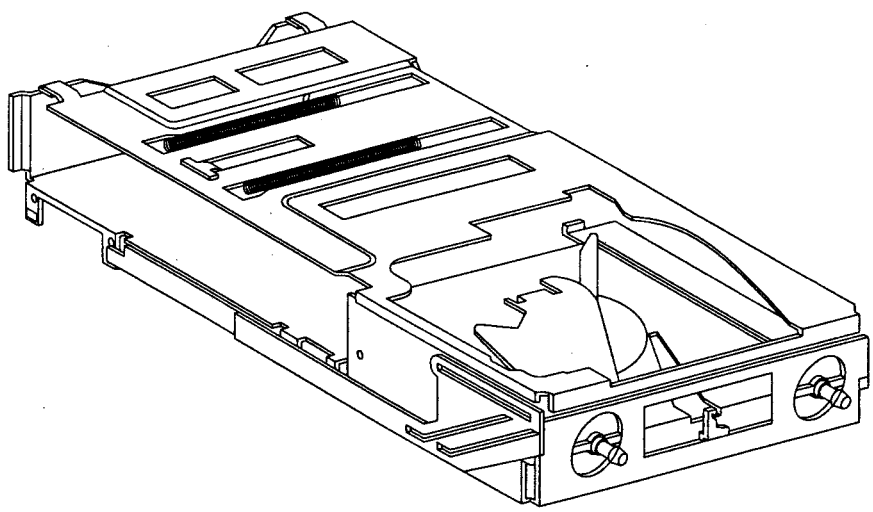
SERVICE MANUAL

CD Changer Mechanism

CD Shuttle

— ADDENDUM & REVISED —

- This manual is described on DT28A21D only. The DT28A21D is developed from DT24A020. For information that is not mentioned in this service manual, refer to the Service Manual • DT SERIES (Part No. 68E22617S01).
- 当モデルは、DT28A21Dについてのみ記載しております。
  又、DT24A020がベースモデルとなっておりますので、相違部分のみ記載されてます。
  詳細については、サービスマニュアル・DT SERIES (68E22617S01) を参照願います。



DT SERIES

Contents

Cabinet Assembly Parts List (Only Difference) 2
Exploded View (CD Mechanism) 3, 4

NOTE : Due to continuing product improvement, specifications and designs are subject to change without notice.

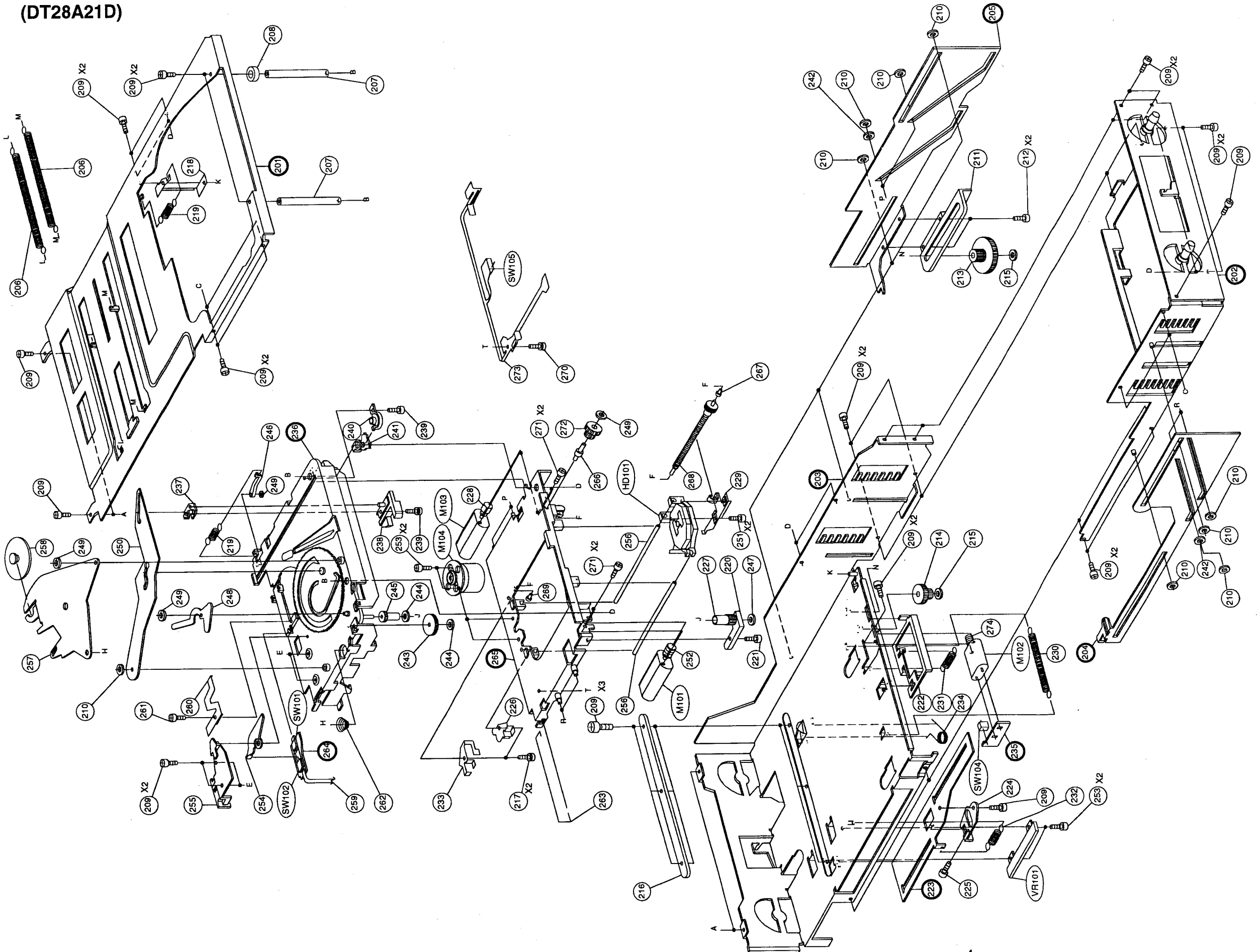
Cabinet Assembly Parts List (Only Difference)

NOTE : For the parts not mentioned, refer to the Service Manual for DT SERIES (Part No. 68E22617S01).

Model		DT24A020			DT28A21D	
Symbol No.	Index	Part No.	Description	Index	Part No.	Description
211		44B51886W01	Rack, Elevator		44B51886W10	Rack, Elevator
213		44A60088W01	Gear, Rack		44A60088W02	Gear, Rack
214		44A60089W01	Gear, Wheel		44A60089W02	Gear, Wheel
216		15A51889W01	Guide, Magazine		15A51889W02	Guide, Magazine
218		45A51880W01	Stopper, Tray		45A51880W02	Stopper, Tray
220		45A60160W01	Spacer, Bracket Motor		45A60160W02	Spacer, Bracket Motor
222		45A51874W01	Slide, Magazine Switch		45A51874W02	Slide, Magazine Switch
224		07A51882W01	Bracket, Sensor		07A51882W02	Bracket, Sensor
226		07B91155W01	Stopper, Shaft (B)		07B91155W02	Stopper, Shaft (B)
228		44A60161W01	Gear, Motor		44A60161W02	Gear, Motor
229		41A60159W01	Spring, Nut DT		41A60159W10	Spring, Nut DT
233		07A91154W01	Stopper, Shaft (A)		07A91154W02	Stopper, Shaft (A)
237		01A51932W01	Assy., Riv. Bracket Push Pull		01A51932W10	Assy., Riv. Bracket Push Pull
238		45A51898W01	Arm, Push Pull		45A51898W02	Arm, Push Pull
240		15A51890W01	Guide, Chassis Tray		15A51890W02	Guide, Chassis Tray
241		07A51884W01	Bracket, Corner		07A51884W02	Bracket, Corner
243		44A52036W01	Gear, Cam		44A52036W02	Gear, Cam
245		44A51896W01	Gear, Driven		44A51896W02	Gear, Driven
246		45A51894W01	Arm, Tray (A)		45A51894W02	Arm, Tray (A)
248		01A51937W01	Assy., Riv. Lever Slide		01A51937W02	Assy., Riv. Lever Slide
250		45A52034W01	Lever, Cam		45A52034W02	Lever, Cam
254		45A51887W01	Arm, Switch		45A51887W02	Arm, Switch
255		15B51891W01	Guide, Tray Side		15B51891W02	Guide, Tray Side
257		07B51879W01	Bracket, Clamper		07B51879W02	Bracket, Clamper
259		84T65057W01	FPC Switch P.W.Board		84T00692K01	FPC Switch P.W.Board
260		41A51872W01	Spring, Clamper		41A51872W10	Spring, Clamper
267		43A60164W01	Bush, Screw (A)		43A60164W02	Bush, Screw (A)
268		01V61300W99	Assy., Shaft Screw		01V21400Y48	Assy., Shaft Screw
269		43A60165W01	Bush, Screw (B)		43A60165W02	Bush, Screw (B)
272		44A60162W01	Gear, Middle		44A60162W02	Gear, Middle
273		84T65058W01	FPC Drive P.W.Board		84T00693K01	FPC Drive P.W.Board

Exploded View (CD Changer Mechanism)

(DT28A21D)



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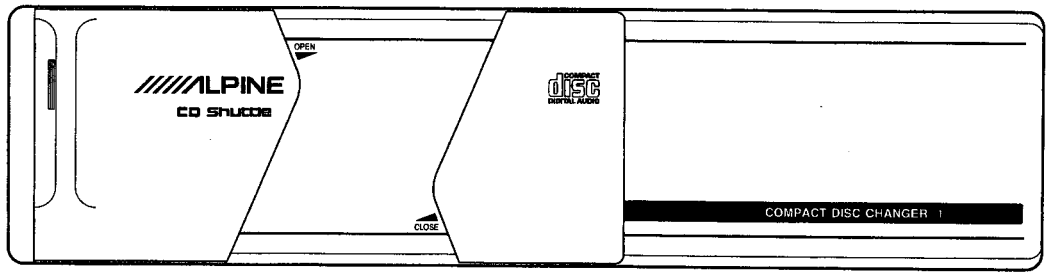
SERVICE MANUAL

Compact Disc Remote Changer

CD Shuttle

COMPACT disc DIGITAL AUDIO

- For the CD deck mechanism parts (DT24A010) of this model, refer to the Service Manual · DT Series (68P61023W01).
- 本機のCDメカニズム(DT24A010)についての資料は、サービスマニュアル・DTシリーズ (68P61023W01) を参照願います。



サービス費用区分	A
技術資料No.	MC-35-0

5960

III. Operating Specifications

The automatic adjustment operations of the 5960 are performed by output of the commands of the various adjustment items from the main microprocessor. Adjustments are performed in response to these commands by the super 1-chip LSI. This servo monitor jig receives the signal returned to the main microprocessor from the super 1-chip LSI and causes the LED to light or go off. The adjustment condition (of either completed or not yet completed) of the various adjustment items can be checked using the lighting condition of this LED.
The following test discs are required for the good/fault judgment:

1. A-BEX TCD-721 (6th track - 1.2mm) : Scratch test disc
2. A-BEX TCD-782 : Signal test disc

Measures to be Taken Corresponding to the LED Indication

1. When a LED other than FAGC or TAGC lights, perform the fault causation analysis using the fault diagnosis chart according to the LED indication.
2. When only the FAGC or TAGC LED turn on a lights (indicating that the focus/tracking fine gain adjustment is not completed), perform the focus/tracking servo gain adjustment. If the value is within the specification, the adjustment is normal.

i) LED indications

Lit : OK Unlit : Fault

Adjustment Order	LED Name	Adjustment Order	Contents
1	AOC2	Tracking offset adjustment	Corrects the tracking error value as an offset.
2	DDT	Disc detection	Detects the presence or absence of a disc.
3	AOC1	Focus offset adjustment	Corrects the focus error value as an offset.
4	AGC1	Focus rough gain adjustment	Determines the amount of external interference applied at the time of the focus rough gain adjustment.
5	AGC2	Tracking rough gain adjustment	Determines the amount of external interference applied at the time of the tracking rough gain adjustment.
6	ABC1	Focus balance adjustment	Provides correction so that the focus error signal can take balance between positive sections and negative sections.
7	ABC2	Tracking balance adjustment	Corrects the average value of the tracking error as a balance value.
8	FAGC	Focus fine gain adjustment	Introduces external interference and adjusts the focus gain to an appropriate value.
9	TAGC	Tracking fine gain adjustment	Introduces external interference and adjusts the tracking gain to an appropriate value.

ii) Seven-Segment LED (LPS Value)

This mechanism has 13 position of 1T to 6T, 1P to 6P,E.
Those positions indicate height of elevator of mechanism in 7 segment LED in hexadecimal.
IC501 reads data from these positions and convert into A/D signal. Hexadecimal and tray location refer to the following list.

* The 1st to 6th disc traies stap each 1T to 6T draw out of magazine.
The 1st to 6th discs stap each 1P to 6P to disc chuck and play.
E is the position that magazine ejects.

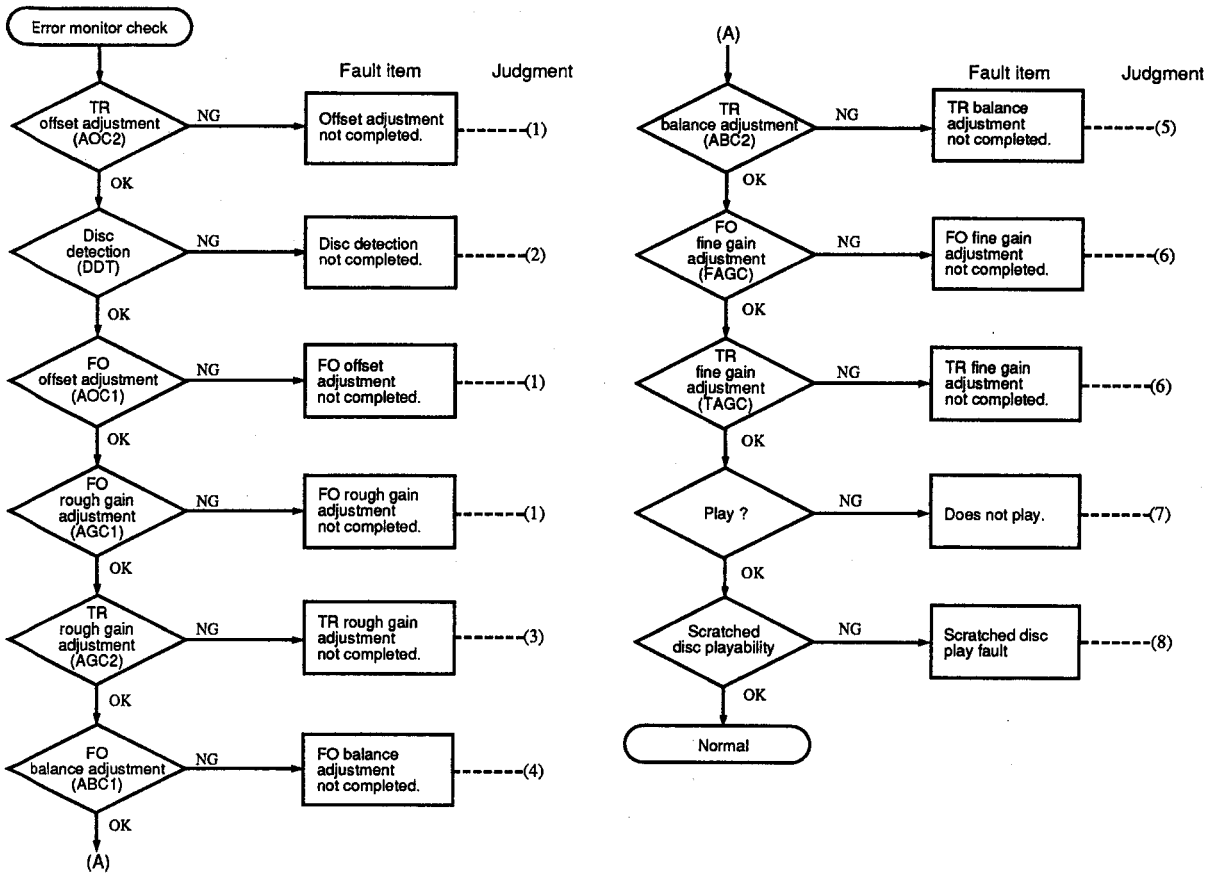
Position			Ratio of Resistance Value (%)	Hex Code
6P			91.00	F2 ~ F6
5P			78.76	D3 ~ D7
	6T		76.17	C1 ~ C5
4P			66.52	63 ~ 67
	5T		63.94	A2 ~ A6
3P			54.29	93 ~ 97
	4T		51.70	82 ~ 86
2P			42.05	74 ~ 78
	3T		39.46	63 ~ 67
1P			29.81	55 ~ 59
	2T		27.22	44 ~ 48
	1T		15.95	27 ~ 31
		E	5.00	0B ~ 0F

NOTE 1: Display of each position is value of limit of HEX code, liner position sensor is normal.

NOTE 2: In case of LPS is normal and disc change actuating is not smooth, check magazine circumference tray chassis again.

IV. Fault Diagnosis Chart

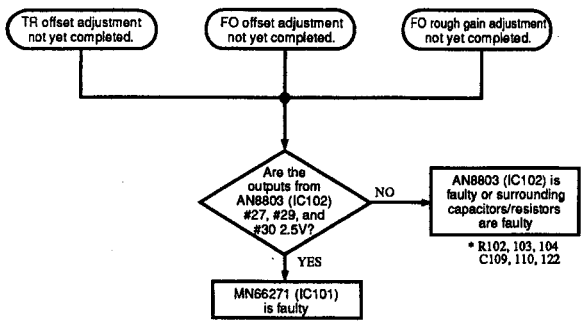
Main Flow Chart



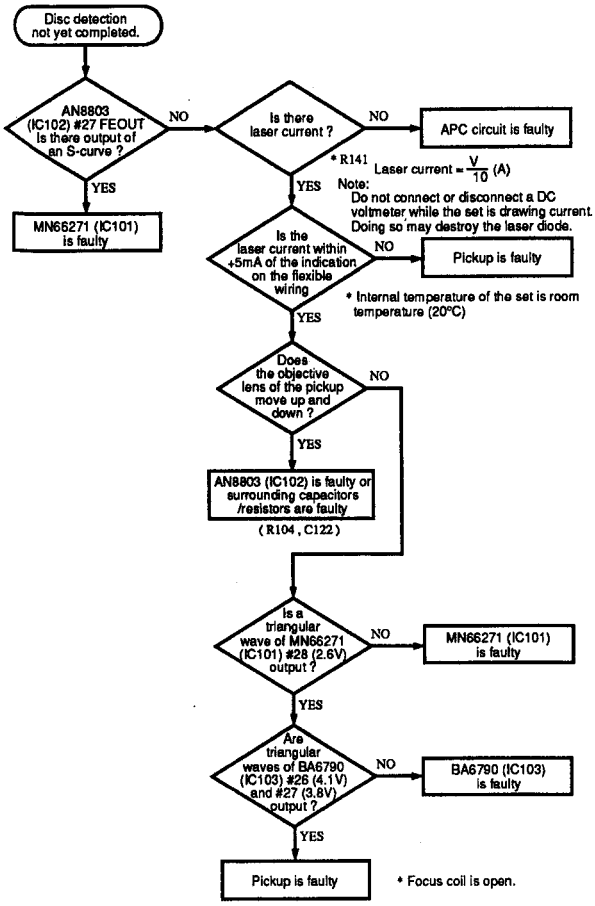
* Notes

1) When more than one LED are light, perform a circuit check according to the order of the main flow chart.
2) Proper soldering of patterns and IC pins is a precondition. Accordingly, when an IC fault is reached in the flow chart, do not replace the part immediately; check the soldering (for loose and bridges).
3) Faults such as faulty capacitors and resistors in the flow include bad parts, different constants, looseness, and cracks.
4) Use track 6 of A-BEX TCD-721 for the scratched disc playability check.

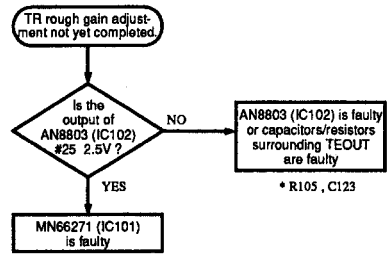
Judgments (1)


TR offset adjustment not yet completed.
FO offset adjustment not yet completed.
FO rough gain adjustment not yet completed.
Are the outputs from AN8803 (IC102) #27, #29, and #30 2.5V?
NO
AN8803 (IC102) is faulty or surrounding capacitors/resistors are faulty
* R102, 103, 104 C109, 110, 122
YES
MN66271 (IC101) is faulty

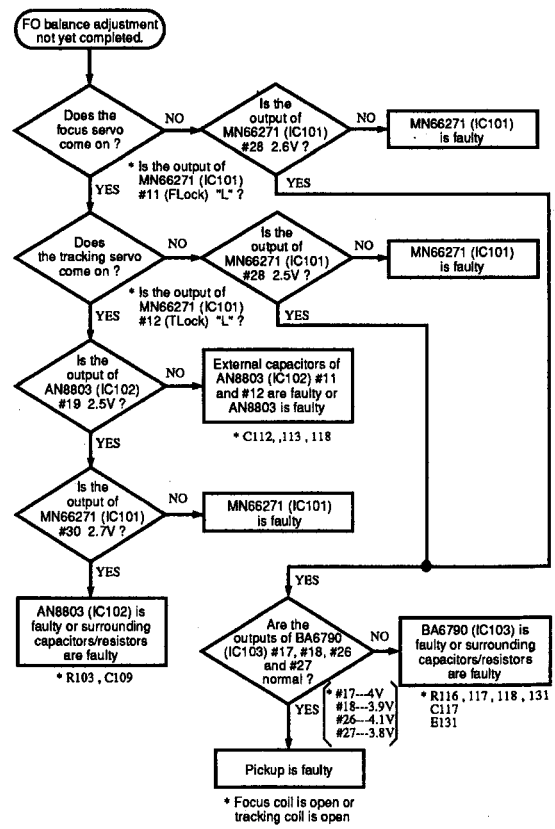
Judgments (2)


Disc detection not yet completed.
AN8803 (IC102) #27 FEOUT Is there output of an S-curve ?
NO
YES
MN66271 (IC101) is faulty
Is there laser current ?
NO
APC circuit is faulty
YES
* R141
Laser current = V/10 (A)
Note:
Do not connect or disconnect a DC voltmeter while the set is drawing current. Doing so may destroy the laser diode.
Is the laser current within ±5mA of the indication on the flexible wiring
NO
Pickup is faulty
YES
* Internal temperature of the set is room temperature (20°C)
Does the objective lens of the pickup move up and down ?
NO
YES
AN8803 (IC102) is faulty or surrounding capacitors /resistors are faulty
(R104 , C122)
Is a triangular wave of MN66271 (IC101) #28 (2.6V) output ?
NO
MN66271 (IC101) is faulty
YES
Are triangular waves of BA6790 (IC103) #26 (4.1V) and #27 (3.8V) output ?
NO
BA6790 (IC103) is faulty
YES
Pickup is faulty
* Focus coil is open.

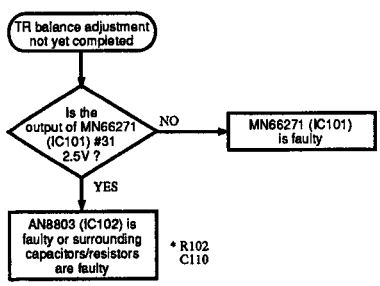
Judgments (3)


TR rough gain adjustment not yet completed.
Is the output of AN8803 (IC102) #25 2.5V ?
NO
AN8803 (IC102) is faulty or capacitors/resistors surrounding TEOUT are faulty
* R105 , C123
YES
MN66271 (IC101) is faulty

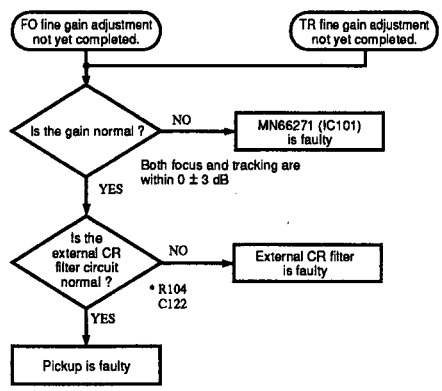
Judgments (4)


FO balance adjustment not yet completed.
Does the focus servo come on ?
NO
Is the output of MN66271 (IC101) #28 2.6V ?
NO
MN66271 (IC101) is faulty
YES
* Is the output of MN66271 (IC101) #11 (FLock) "L" ?
YES
Does the tracking servo come on ?
NO
Is the output of MN66271 (IC101) #28 2.5V ?
NO
MN66271 (IC101) is faulty
YES
* Is the output of MN66271 (IC101) #12 (TLock) "L" ?
YES
Is the output of AN8803 (IC102) #19 2.5V ?
NO
External capacitors of AN8803 (IC102) #11 and #12 are faulty or AN8803 is faulty
* C112, ,113 , 118
YES
Is the output of MN66271 (IC101) #30 2.7V ?
NO
MN66271 (IC101) is faulty
YES
AN8803 (IC102) is faulty or surrounding capacitors/resistors are faulty
* R103 , C109
YES
Are the outputs of BA6790 (IC103) #17, #18, #26 and #27 normal ?
NO
BA6790 (IC103) is faulty or surrounding capacitors/resistors are faulty
* R116 , 117 , 118 , 131 C117 E131
YES
* #17---4V #18---3.9V #26---4.1V #27---3.8V
Pickup is faulty
* Focus coil is open or tracking coil is open

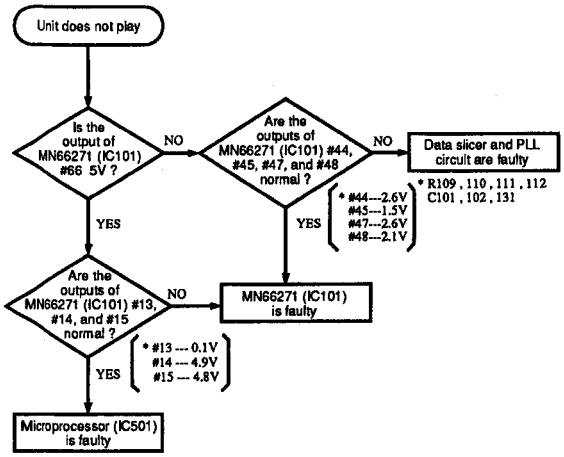
Judgments (5)


TR balance adjustment not yet completed
Is the output of MN66271 (IC101) #31 2.5V ?
NO
MN66271 (IC101) is faulty
YES
AN8803 (IC102) is faulty or surrounding capacitors/resistors are faulty
* R102 C110

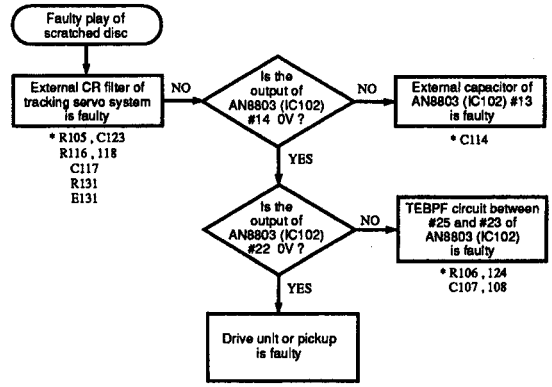
Judgments (6)


FO fine gain adjustment not yet completed.
TR fine gain adjustment not yet completed.
Is the gain normal ?
NO
MN66271 (IC101) is faulty
Both focus and tracking are within 0 ± 3 dB
YES
Is the external CR filter circuit normal ?
NO
External CR filter is faulty
* R104 C122
YES
Pickup is faulty

Judgments (7)


Unit does not play
Is the output of MN66271 (IC101) #66 5V ?
NO
Are the outputs of MN66271 (IC101) #44, #45, #47, and #48 normal ?
NO
Data slicer and PLL circuit are faulty
* R109 , 110 , 111 , 112
C101 , 102 , 131
YES
* #44---2.6V
#45---1.5V
#47---2.6V
#48---2.1V
YES
Are the outputs of MN66271 (IC101) #13, #14, and #15 normal ?
NO
MN66271 (IC101) is faulty
* #13 --- 0.1V
#14 --- 4.9V
#15 --- 4.8V
YES
Microprocessor (IC501) is faulty

Judgments (8)


Faulty play of scratched disc
External CR filter of tracking servo system is faulty
NO
Is the output of AN8803 (IC102) #14 0V ?
NO
External capacitor of AN8803 (IC102) #13 is faulty
* C114
* R105 , C123
R116 , 118
C117
R131
E131
YES
Is the output of AN8803 (IC102) #22 0V ?
NO
TEBPF circuit between #25 and #23 of AN8803 (IC102) is faulty
* R106 , 124
C107 , 108
YES
Drive unit or pickup is faulty

Measurements

A. RF Signal Level Measurement

The main beam of the returning light is received by the photodiode and the output voltage is obtained by current-voltage conversion of A+B+C+D.

1. Block Diagram

2. Measurement Method

(a). Connect the ground terminal of the oscilloscope VREF (AN8803SB (IC102), PIN 20) and measure the RF signal (of AN8803SB (IC102), pin 7).
(b). Play the first track of the measurement disc A-BEX TCD-782.
(c). Read the peak-to-peak value of the waveform.
Specification: 0.5V ±0.2
* When the value is outside of the specification (i.e., not good), check AN8803 (IC102), the pickup, and R136/C120.

B. Jitter Measurement

The standard deviation of the pulse width when a trigger is applied to the rising edge of the 3T component of the RF signal.

1. Block Diagram

2. Measurement Method

(a). Connect the ground terminal of the jitter meter to VREF (AN8803SB (IC102), PIN 20) and measure the ARF signal (of AN8803SB (IC102), pin 10).
(b). Play the first track of the A-BEX TCD-782 measurement disc.
(c). Read the indicated value of the jitter meter.
Specification: 25nS or less
* When the value is outside of the specification, check AN8803 (IC102), the pickup, and R136/C120.

C. Focus Servo Gain Measurement

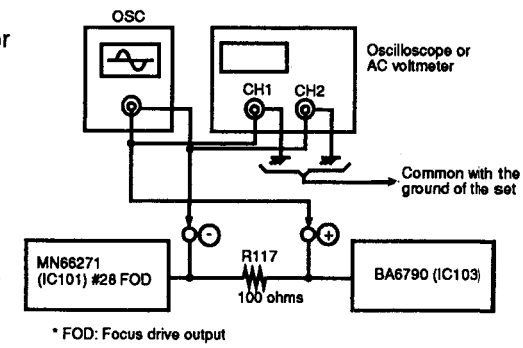
Measure the focus servo open loop gain in the servo-on (closed loop) condition.

1. Block Diagram

2. Measurement Method using an Oscillator and an Oscilloscope

(a). Connect OSC output to rsistor for gain measurement (100 ohms). (Connect a servo driver side to positive side.)
(b). Connect CH1 of oscilloscope to a servo driver side of resistor for gain measurement (100 ohms). (Connect negative side with GND of set.)
(c). Connect CH2 of oscilloscope to MN66271 side of resistor for gain measurement (100 ohms). (Connect negative side with GND of set.)
(d). Play back the eighth track of A-BEX TCD-782 disc for measurement. (No sound recording track)
(e). Output frequency (1.2 kHz, 150 mVP-P) from OSC and compare the amplitude of CH1 and CH2 of oscilloscope and convert into dB.
NOTE: AC voltmeter is available to measurement.

3. Connection (Example)

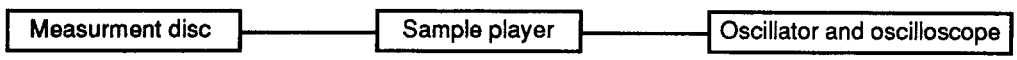


* FOD: Focus drive output

D. Tracking Servo Gain Measurement

Measure the tracking servo open loop gain in the servo-on (closed loop) condition.

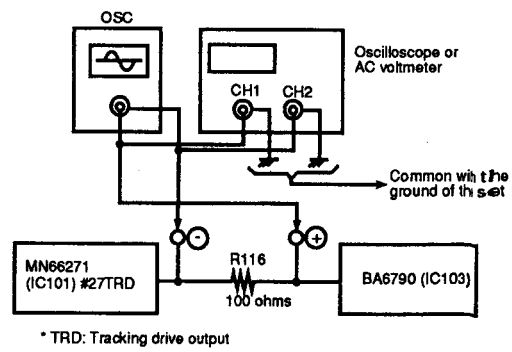
1. Block Diagram



2. Measurement Method using an Oscilloscope

(a). Connect OSC output to rsistor for gain measurement (100 ohms). (Connect a servo driver side to positive side.)
(b). Connect CH1 of oscilloscope to a servo driver side of resistor for gain measurement (100 ohms). (Connect negative side with GND of set.)
(c). Connect CH2 of oscilloscope to MN66271 side of resistor for gain measurement (100 ohms). (Connect negative side with GND of set.)
(d). Play back the eighth track of A-BEX TCD-782 disc for measurement. (No sound recording track)
(e). Output frequency (1.2 kHz, 150 mVP-P) from OSC and compare the amplitude of CH1 and CH2 of oscilloscope and convert into dB.
NOTE: AC voltmeter is available to measurement.

3. Connection (Example)



* TRD: Tracking drive output

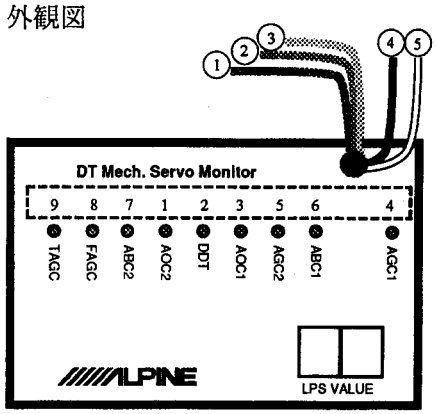
サーボモニターについて (Part No. 01E20845S01)

I. 目的

5960では、デジタル信号処理をSuper 1 chip LSI内で処理しており、従来の外部調整回路もこのLSI内に内蔵されており、各種調整が自動で行なわれています。 このDT Mechanism Servo Monitorは、これらの自動調整が正常動作しているかを判定する治具で、以下の確認を行ないます。

1. 調整が正確に行なわれたかを表示します。
2. 自動調整の良否判定を行ないます。
3. 不具合項目をLED表示し、サーボ回路の不良解析を容易にします。

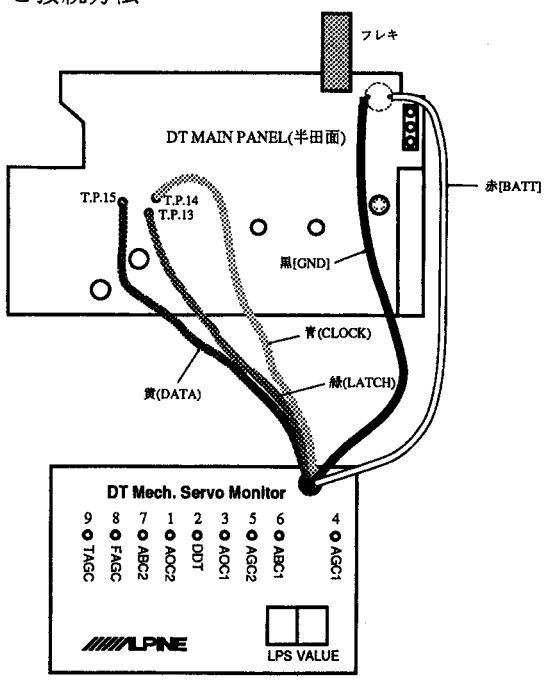
外観図



	①	②	③	④	⑤
ﾜｲﾔｰｶﾗｰ	黄色	緑色	青色	黒色	赤色
名 称	DATA	LATCH	CLOCK	GND	BATT

＊破線内の数字は、自動調整順位を意味します。

II.接続ポイントと接続方法



各ワイヤーを図のポイントへ接続する。
＊テストポイントが近接しているのでショートしないよう十分に注意して下さい。

III.動作仕様

5960の自動調整動作は、メインマイコンから各調整項目のコマンドを出しスーパー1チップLSIでは、そのコマンドに応じて調整を行います。このサーボモニター治具は、スーパー1チップLSIからメインマイコンに返ってきた信号を受け、LEDを点灯もしくは消灯させます。　このLEDの点灯状態により、各調整項目の調整状態(完了/未完了)を確認することが出来ます。
良否判定には、次のテストディスクが必要です。

1. A-BEX TCD-721 (6曲目-1.2mm) : スクラッチテストディスク
2. A-BEX TCD-782 : 信号テストディスク

LED表示に対する処置方法

1. FAGC, TAGC以外のLEDが点灯した場合は、LED表示に従って不良診断チャートにより不良原因解析を行なって下さい。
2. FAGC, TAGCのLEDのみ点灯した場合(フォーカス/トラッキング精AGCが未完了)は、フォーカス/トラッキングサーボゲイン測定を行なってスペック内であれば正常です。

i) 各LEDについて

消灯：OK　　点灯：NG

調整順位	LED名称	調整項目	内容
1	AOC2	トラッキング オフセット調整	トラッキングエラー値をオフセットとして補正する。
2	DDT	ディスク検出	ディスクの有無を検知する。
3	AOC1	フォーカス オフセット調整	フォーカスエラー値をオフセットとして補正する。
4	AGC1	フォーカス 粗ゲイン調整	フォーカス精ゲイン調整時の外乱注入量を決定する。
5	AGC2	トラッキング 粗ゲイン調整	トラッキング精ゲイン調整時の外乱注入量を決定する。
6	ABC1	フォーカス バランス調整	フォーカスエラー信号が正区間と負区間でバランスがとれる様に補正する。
7	ABC2	トラッキング バランス調整	トラッキングエラーの平均値をバランス値として補正する。
8	FAGC	フォーカス 精ゲイン調整	外乱を注入しフォーカスゲインを適正値に調整する。
9	TAGC	トラッキング 精ゲイン調整	外乱を注入しトラッキングゲインを適正値に調整する。

ii) 7セグメントLEDについて(LPS VALUE)

本メカは、1T～6T, 1P～6P, Eの13ポジションを持つています。そこで7セグメントLEDによりメカのエレベータ高さを16進(文字コード)表示致します。　LPS（リニアポジションセンサー）により得られたデータをIC501のマイコンが読み取り、A/D変換する。　この値により1枚目～6枚目のディスク引き込み位置及びプレイ位置そしてイジェクト位置を知ることが出来ます。下表は16進の値とトレイ位置の対応表です。

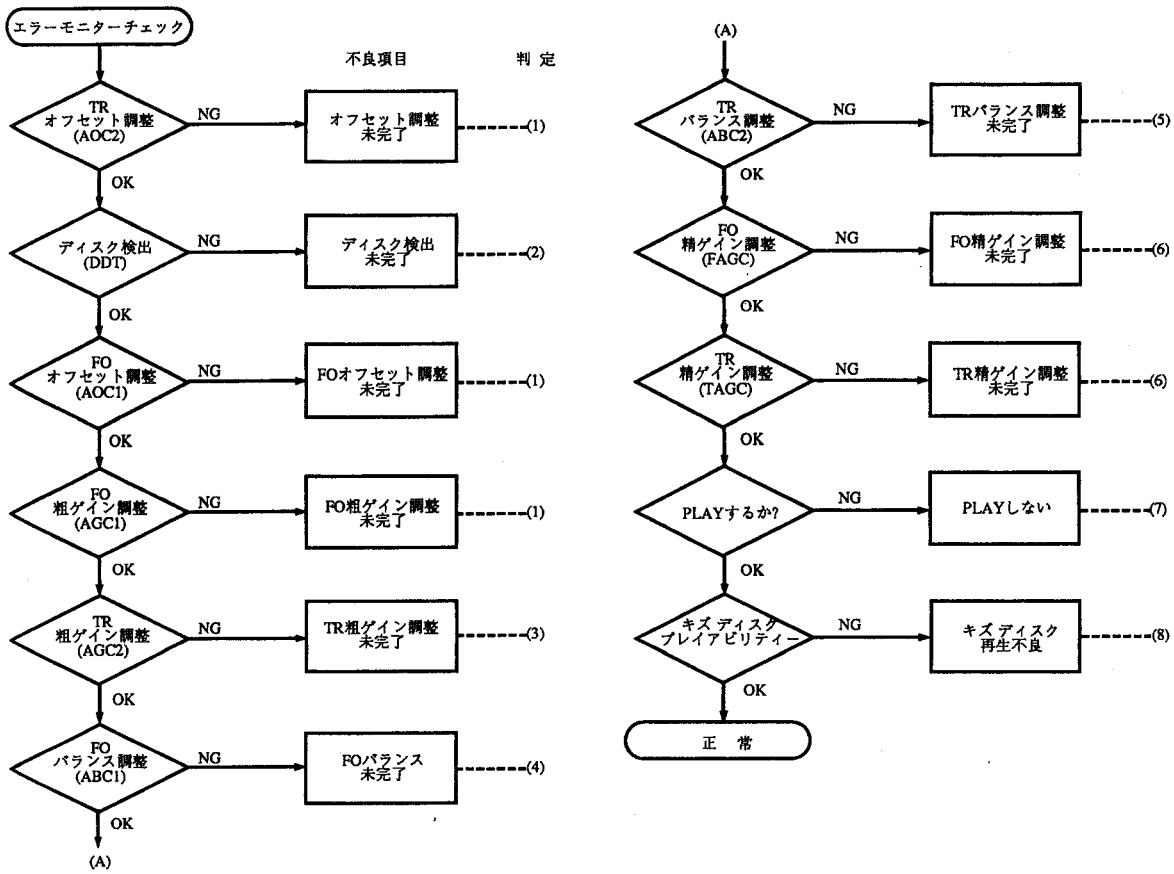
* 1T～6Tは、それぞれ1番～6番のディスクトレイをマガジンから引き出すポジション
  1P～6Pは、それぞれ1番～6番のディスクをチャッキングし、PLAYするポジション
  Eは、マガジンをEJECTするポジションです。

ポジション			抵抗値の比（%）	HEXコード
6P			91.00	F2～F6
5P			78.76	D3～D7
	6T		76.17	C1～C5
4P			66.52	B3～B7
	5T		63.94	A2～A6
3P			54.29	93～97
	4T		51.70	82～86
2P			42.05	74～78
	3T		39.46	63～67
1P			29.81	55～59
	2T		27.22	44～48
	1T		15.95	27～31
		E	5.00	0B～0F

注1) 各ポジションに於ける表示がHEXコードの範囲内の値であれば、リニアポジション センサー(LPS)は正常です。
注2) LPS（リニアポジションセンサー）が正常にかかわらずディスクチェンジ動作がスムーズに行なわれない時は、マガジン/トレイシャーシ周りの確認を行なって下さい。

IV. 不良診断チャート

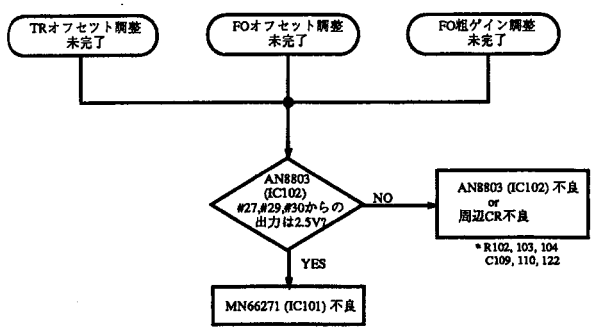
メインフローチャート



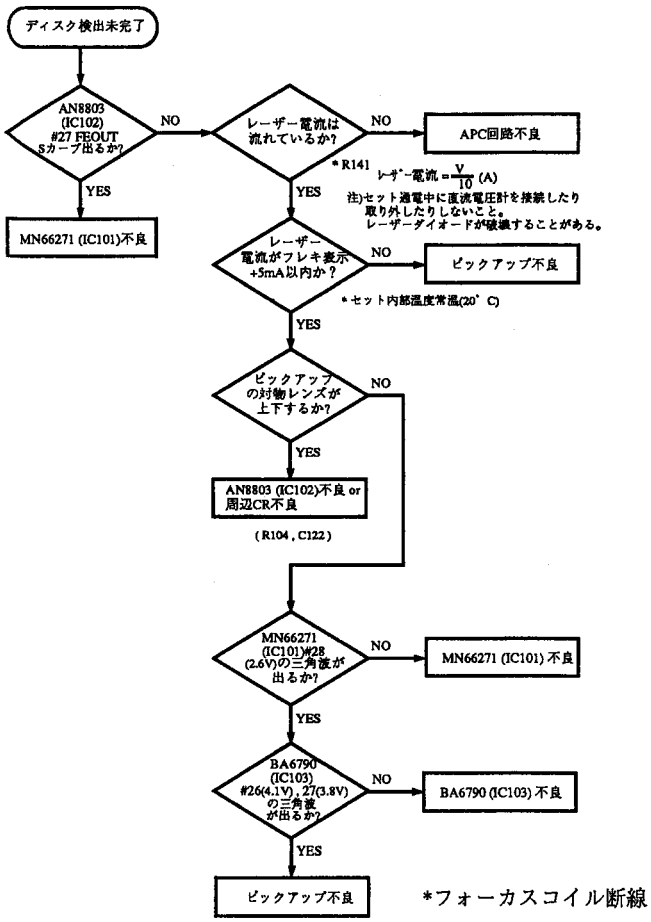
* 注記

1) 複数のLEDが点灯した場合は、メインフローの順番に従って回路チェックを行なって下さい。
2) パターンやIC端子の半田付けは正常であることが前提です。従って、フローチャートにてIC不良にたどりついた時は、直ぐに交換せず半田付け (ルーズ、ブリッジ)の確認を行なって下さい。
3) フロー中のC,R不良等の"不良"とは"欠品" "定数違い" "ルーズ" "クラック"も含まれています。
4) キズディスクプレイアビリティーは、A-BEX TCD-721(6曲目)を使用して下さい。

判定 (1)

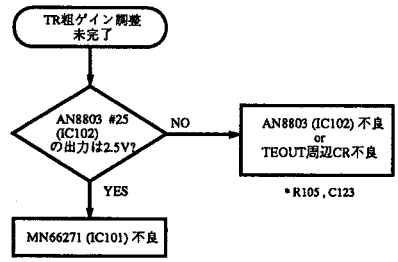


判定 (2)

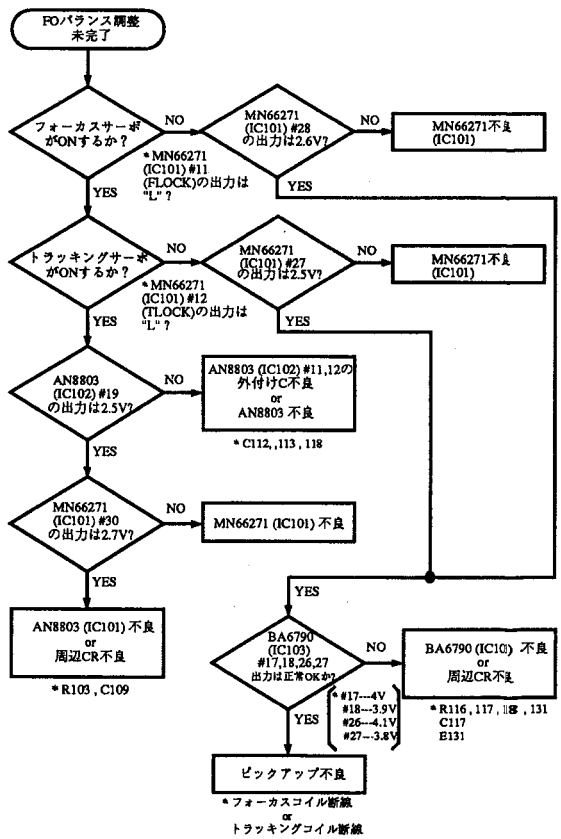


*フォーカスコイル断線

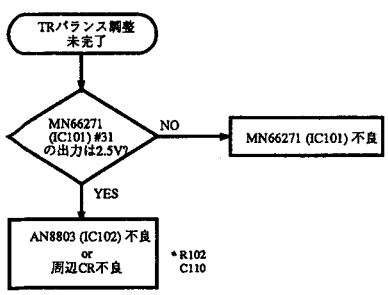
判定 (3)



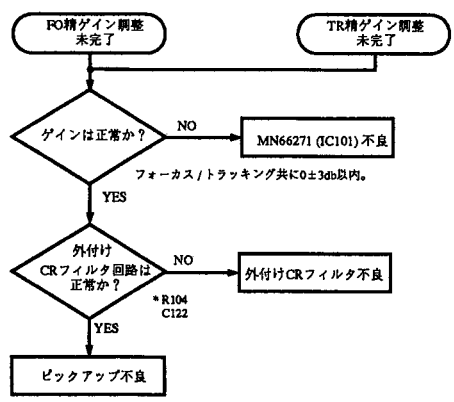
判定 (4)



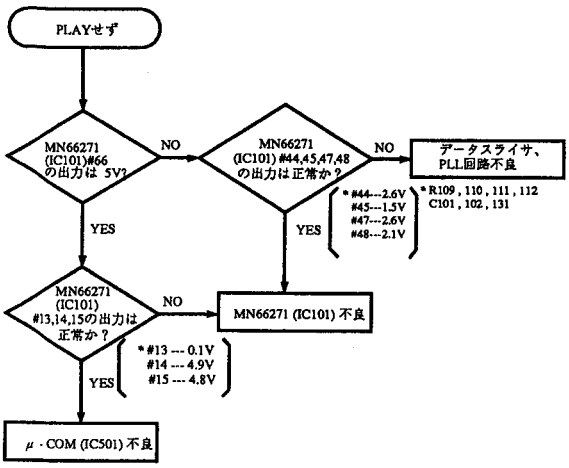
判定 (5)



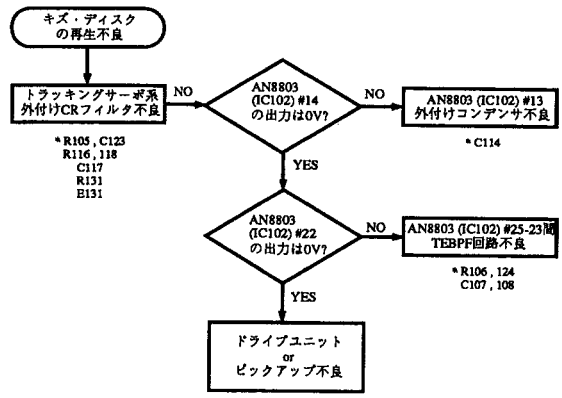
判定 (6)



判定 (7)



判定 (8)

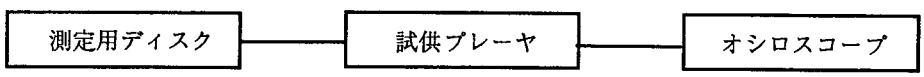


測定要領

A. RF信号レベル測定

戻り光のメインビームをフォトダイオードで受光し、A+B+C+Dの電流 - 電圧変換した出力電圧。

(1) ブロック図



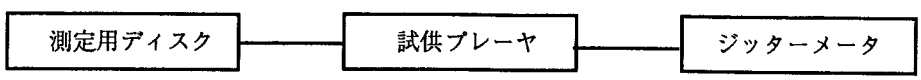
(2) 測定法

(a) オシロスコープのGND端子をVREF(AN8803SB (IC102), 20番ピン)に接続し、RF信号(AN8803SB (IC102), 7番ピン)を測定する。
(b) 測定用ディスク A-BEX TCD-782の1曲目を再生する。
(c) 波形のP - P値を読み取る。
スペック : 0.5V ± 0.2
* スペックアウト(NG)の場合は、AN8803SB (IC102)/ ピックアップ / R136,C120を確認して下さい。

B. ジッター測定

RF信号の3T成分の立ち上がりエッジにトリガーをかけた時のパルス幅の標準偏差。

(1) ブロック図



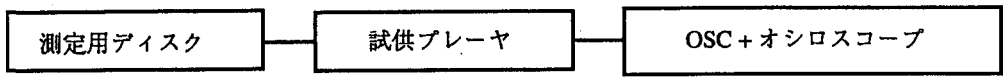
(2) 測定方法

(a) ジッターメータのGND端子をVREF(AN8803SB (IC102), 20番ピン)に接続し、ARF信号(AN8803SB (IC102), 10番ピン)を測定する。
(b) 測定用ディスクA-BEX TCD-782の1曲目を再生する。
(c) ジッターメーターの指示値を読み取る。
スペック : 25nS以下。
*スペックアウト(NG)の場合は、AN8803SB (IC102)/ ピックアップ / R136,C120を確認して下さい。

C. フォーカス・サーボ・ゲイン測定

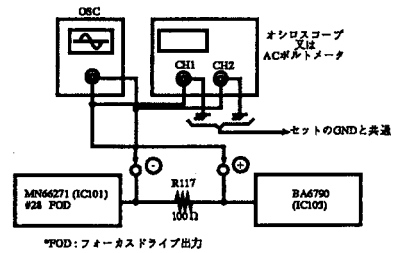
フォーカス・サーボ・オープンループゲインをサーボON
(クローズドループ)状態で測定する。

(1) ブロック図



(2) 測定法 --- OSCとオシロスコープを用いる方法。

(3) 接続例

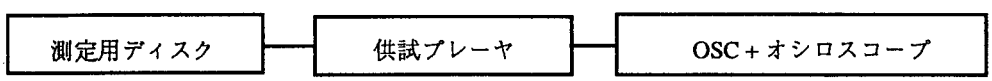


(a) ゲイン測定抵抗(100Ω)の両端にOSCを接続する。
(サーボドライバー側がホット)
(b) オシロスコープのCH1(ホット側)をゲイン測定抵抗(100Ω)のサーボドライバー側に接続する。(コールド側はセットのGNDに接続)
(c) オシロスコープのCH2(ホット側)をゲイン測定抵抗(100Ω)のMN66271側(IC101)に接続する。(コールド側はセットのGNDに接続)
(d) 測定用ディスクA-BEX TCD-782の8曲目 (無音部)を再生する。
(e) OSCから1.2KHz 150mVP-P の信号を出力し、オシロスコープのCH1とCH2信号の振幅を比較し、デシベルに換算する。
Gain (db) = 20 Log (CH2 / CH1)
スペック：ゲイン 0±3db以内であれば正常。
*スペックアウト(NG)の場合はMN66271(IC101)(ｽｰﾊﾟｰ-1ﾁｯﾌﾟ LSI)不良
注) オシロスコープの代わりに、ACボルトメーターを用いてもよい。

D. トラッキング・サーボ・ゲイン測定

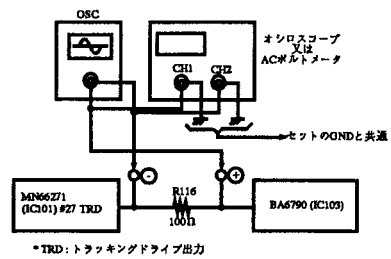
トラッキング・サーボ・オープンループゲインをサーボON
(クローズドループ)状態で測定する。

(1) ブロック図



(2) 測定法 --- オシロスコープを用いる方法。

(3) 接続例



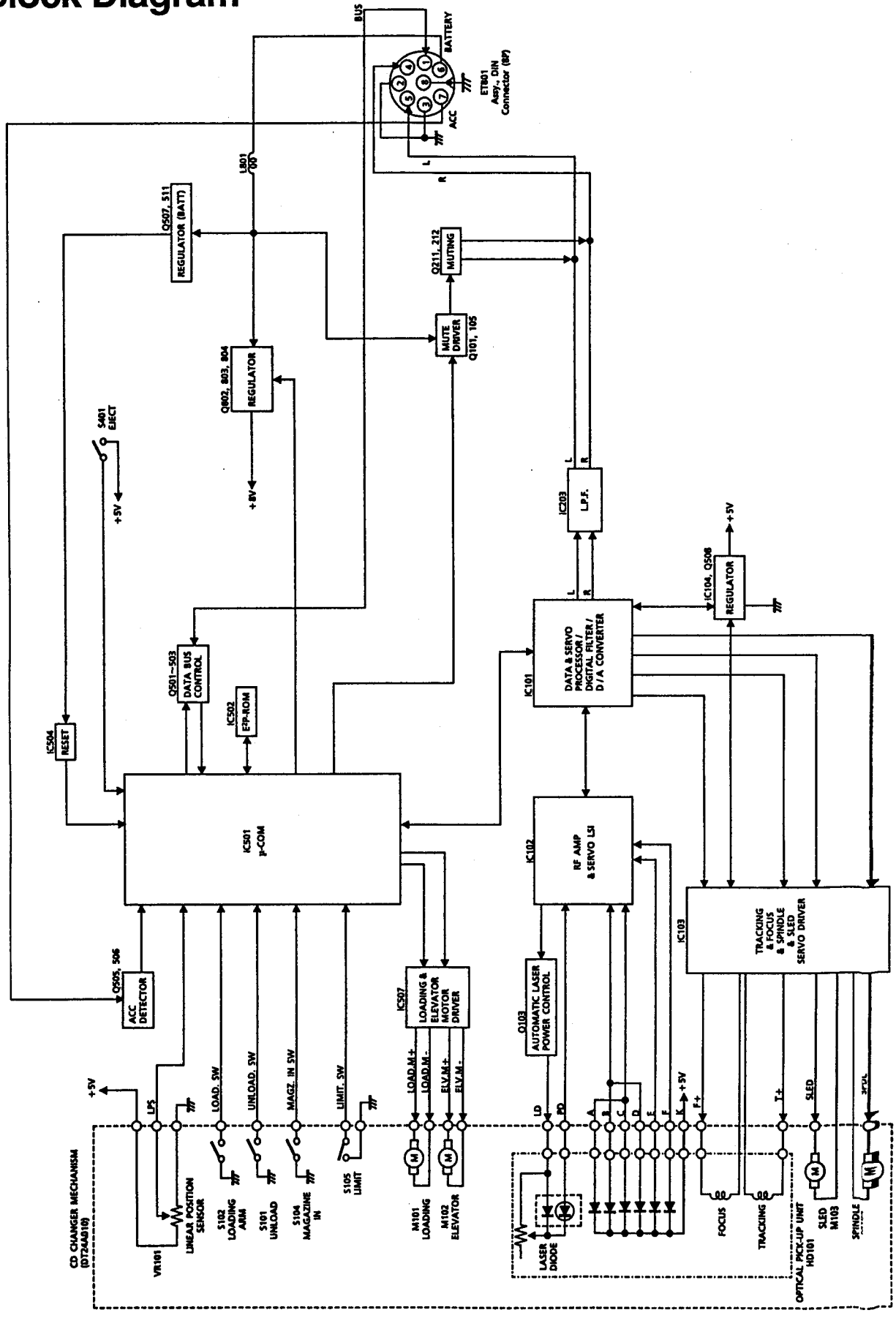
(a) ゲイン測定抵抗(100Ω)の両端にOSCを接続する。
(サーボドライバー側がホット)
(b) オシロスコープのCH1(ホット側)をゲイン測定抵抗(100Ω)のサーボドライバー側に接続する。(コールド側はセットのGNDに接続)
(c) オシロスコープのCH2(ホット側)をゲイン測定抵抗(100Ω)のMN66271(IC101)側に接続する。(コールド側はセットのGNDに接続)
(d) 測定用ディスクA-BEX TCD-782の8曲目 (無音部)を再生する。
(e) OSCから1.2KHz 150mVP-P の信号を出力し、オシロスコープのCH1とCH2信号の振幅を比較し、デシベルに換算する。
Gain (db) = 20Log (CH2 / CH1)
スペック：ゲイン 0±3db以内であれば正常。
* スペックアウト(NG)の場合は、MN66271(IC101) (ｽｰﾊﾟｰ-1ﾁｯﾌﾟ LSI)不良
注) オシロスコープの代わりに、ACボルトメーターを用いてもよい。

Description of IC Terminal

45552W24 (IC501)

No.	Symbol	I / O	Terminal Description
1~5	NC	—	N.C.
6	SCL	I / O	E²P-ROM (IC502) Clock.
7	SDA	I / O	E²P-ROM (IC502) Data.
8	NC	—	N.C.
9	GND	—	GND.
10	A0	O	Auto adjustment output. (LATCH)
11	A1	O	Auto adjustment output. (CLOCK)
12	A2	O	Auto adjustment output. (DATA)
13	ELVM+	O	Elevator motor (+) output.
14	ELVM-	O	Elevator motor (-) output.
15	LODM+	O	Loading motor (+) output.
16	LODM-	O	Loading motor (-) output.
17	EJLED	O	EJECT KEY LED lighting control.
18	TMPSW	I	LO TEMP Switch.
19~21	NC	—	N.C.
22	STAT	I	Start signal input.
23	TLOCK	I	Tracking servo pull in signal.
24	GND	—	GND.
25	FLOCK	I	Focus servo pull in signal.
26	SENSE	I	Sense signal input.
27	NC	—	N.C.
28	MLD	O	LSI Control latch output.
29	MDATA	O	LSI Control data output.
30	MCLK	O	LSI Control clock.
31	XRST	O	Surroundings reset.
32	D MUTE	O	Digital MUTE output.
33	A MUTE	O	Analog MUTE output.
34	V CONT	O	Power supply control.
35	RST	I	RESET Input.
36	BI	I	BUS Input.
37	BATT	I	BATT Detect.
38	ACC	I	ACC Detect.
39	BLKCK	I	Sub code block clock.
40	+5V	—	+5V.
41	X2	—	System clock 2. (4.19MHz)
42	X1	—	System clock 1. (4.19MHz)
43	IC	—	GND.
44,45	NC	—	N.C.
46	GND	—	GND.
47	LPS	I	Linear position sensor.
48	TEMP	I	Temperature detect sensor.
49	DOSW	I	Light ON / OFF switch.
50	ULDSW	I	Unloading detect switch.
51	LODSW	I	Loading detect switch.
52	MAGSW	I	Magazine detect switch.
53	LMTSW	I	Limit switch.
54	EJKEY	I	Eject KEY input.
55, 56	+5V	—	+5V.
57	SUBQ	I	SUBQ Input.
58	NC	—	N.C.
59	SQCK	O	SQCK clock output.
60	NC	—	N.C.
61	BUSOUT	O	BUS output.
62~64	NC	—	N.C.

Block Diagram



Schematic Diagram

IC	IC102 IC507 IC103	IC502	IC104	IC501 IC101	IC504	IC203	Q505 Q506 Q503 Q105
Transistor (Q)	Q508	Q103		Q510 Q509	Q802 Q501	Q804 Q502	Q803 Q211

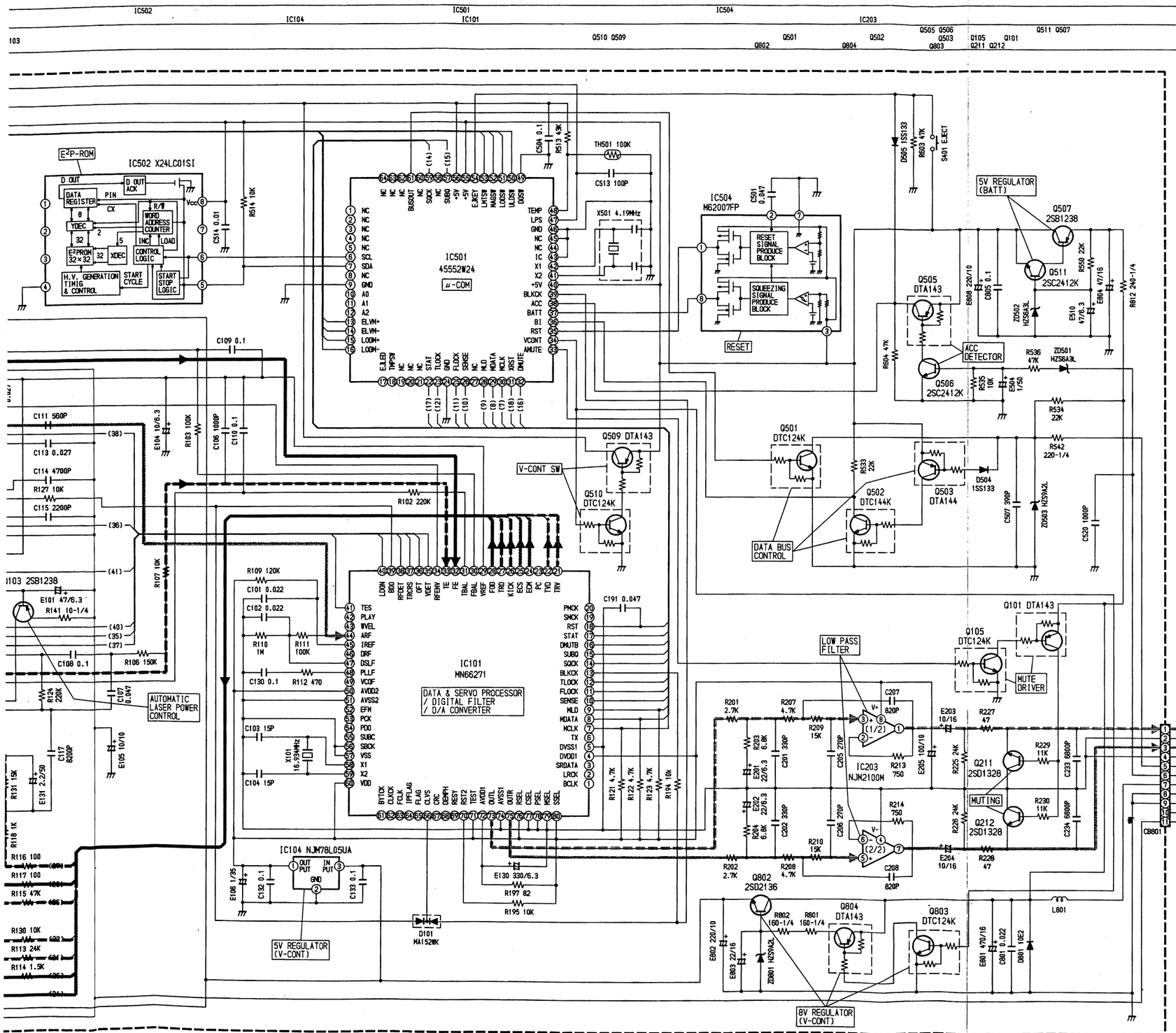
Main P.C.Board

Elevator P.C.Board
N102 ELEVATOR
S104 MAGAZINE IN
VR101 10K
CB501
R506 47K
IC507 LB1836M
THERMAL SHUTDOWN
LOADING AND ELEVATOR MOTOR DRIVER
E²P-ROM
IC502 X24LC01SI
R514 10K
C514 0.01
C503 0.22
C515 0.22
TH501 100K
C513 100P
C504 0.1
R513 4.3K
IC501 45552W24 μ-COM
X501 4.19MHz
IC504 M62007FP
RESET SIGNAL PRODUCE BLOCK
SQUEEZING SIGNAL PRODUCE BLOCK
RESET
C501 0.047
D505 1SS133
R603 47K
S401 EJECT
5V (BA
N101 LOADING
CB502
N103 SLED
S105 LIMIT
N104 SPINDLE
S101 UNLOAD
S102 LOADING ARM
Switch P.C.Board
Pick Up Unit (HD101)
TRACKING
FOCUS
LASER DIODE
CB503
VR 2K
RF AMP & SERVO LSI
R509 47K
R507 47K
R508 47K
IC102 AN8803SB
EQ
ACC
RF DETECTOR
ENV DETECTOR
SDO
OFTR
VCBA
C124 0.1
C121 0.1
C119 0.1
R101 6.2K
C122 390P
R104 22K
E103 1/50
C112 100P
C118 0.027
C111 560P
C113 0.027
C114 4700P
R127 10K
C115 2200P
Q103 2SB1238
E101 47/6.3
R141 10-1/4
C123 47P
R105 39K
C108 0.1
R106 150K
R107 10K
C109 0.1
E104 10/6.3
R103 100K
C105 1000P
C110 0.1
R102 220K
Q509 DTA143
V-CONT SW
Q510 DTC124K
Q501 DTC124K
Q502 DTC144K
Q503 DTA144
R533 22K
R504 1SS133
DATA BUS CONTROL
R109 120K
C101 0.022
C102 0.022
R110 1M
R111 100K
C130 0.1
R112 470
C103 15P
X101 16.93MHz
C104 15P
IC101 MN66271
DATA & SERVO PROCESSOR / DIGITAL FILTER / D/A CONVERTER
C191 0.047
LOW PASS FILTER
Q105 DTC124K
IC203 NJM2100M
R201 2.7K
R207 4.7K
R209 15K
C207 82P
C201 330P
C205 270P
R203 6.8K
E201 22/6.3
R213 150
E205 100/10
R225 24K
R227 47
R202 2.7K
R208 4.7K
R210 15K
C208 82P
C202 330P
C206 270P
R204 6.8K
E202 22/6.3
R214 150
E204 10/16
R226 24K
R228 47
Q802 2SD2136
R802 160-1/4
R801 160-1/4
Q804 DTA143
Q803 DTC124K
E802 220/10
E803 22/16
ZD801 HZS9A2L
E801 470/16
8V REGULATOR (V-CONT)
IC104 NJM78L05UA
C132 0.1
C133 0.1
E106 1/35
5V REGULATOR (V-CONT)
E130 330/6.3
R197 82
R195 10K
D101 MA152WK
TRACKING/ FOCUS/SLED/ SPINDLE SERVO DRIVER
IC103 BA6790FP
5V REGULATOR (V-CONT)
Q508 2SB1238
T.S.D
LEVEL SHIFT
DRIVER MUTE
R235 12K
R131 15K
E131 2.2/50
R116 1K
R116 100
R117 100
R115 47K
R130 10K
R113 24K
R114 1.5K
R118 12K
E511 100/10
E113 100/10
C502 0.01
C117 820P
E105 10/10
R124 220K
C107 0.047
AUTOMATIC LASER POWER CONTROL
R136 2.2K
C120 0.01
C128 0.01
E128 4.7/16
0.1

A | B | C | D | E | F | G | H

NOTES:

1. All resistance values are in ohms. K = 1,000
2. All capacitance values are in microfarads. $P = \frac{1}{1{,}000{,}000}$



IC101

1	NC	21	2.5V	41	0V	61	NC
2	NC	22	2.5V	42	NC	62	NC
3	NC	23	NC	43	NC	63	NC
4	5V	24	2.5V	44	2.6V	64	NC
5	0V	25	2.5V	45	1.5V	65	NC
6	NC	26	2.5V	46	NC	66	5V
7	5V	27	2.5V	47	2.6V	67	5V
8	5V	28	2.6V	48	2.1V	68	NC
9	5V	29	2.5V	49	NC	69	5V
10	0V	30	2.7V	50	5V	70	5V
11	0V	31	2.5V	51	0V	71	5V
12	0V	32	2.5V	52	NC	72	5V
13	0.1V	33	2.5V	53	NC	73	2.5V
14	4.9V	34	2.5V	54	NC	74	0V
15	4.8V	35	0V	55	NC	75	2.5V
16	0V	36	0V	56	0V	76	5V
17	4.8V	37	1.3V	57	0V	77	0V
18	5V	38	0V	58	2.5V	78	0V
19	NC	39	0V	59	2.3V	79	0V
20	NC	40	5V	60	5V	80	5V

IC102

1	0.2V	19	2.5V
2	4V	20	2.5V
3	5V	21	0V
4	0.2V	22	0V
5	5V	23	2.5V
6	2.5V	24	1.3V
7	2.8V	25	2.5V
8	2.5V	26	2.5V
9	3.7V	27	2.5V
10	1.6V	28	2.5V
11	3.9V	29	2.5V
12	3.2V	30	2.5V
13	3.6V	31	2.5V
14	0V	32	2.5V
15	3.6V	33	2.5V
16	0V	34	2.5V
17	0V	35	2.5V
18	0V	36	2.5V

IC103

1	4.2V	15	2.5V
2	3.6V	16	2.5V
3	2.5V	17	4V
4	NC	18	3.9V
5	7.3V	19	2.5V
6	5V	20	2.5V
7	7.9V	21	7.9V
8	0V	22	7.9V
9	2.5V	23	2.5V
10	2.5V	24	2.5V
11	4V	25	2.6V
12	4V	26	4.1V
13	0V	27	3.8V
14	2.5V	28	0V

IC104

1	5V
2	0V
3	7.9V

IC203

1	2.5V
2	2.5V
3	2.5V
4	0V
5	2.5V
6	2.5V
7	2.5V
8	5V

IC502

1	NC
2	NC
3	NC
4	0V
5	5V
6	0V
7	NC
8	5V

IC504

1	5V
2	4.9V
3	5V
4	NC
5	NC
6	NC
7	0V
8	5V

IC507

1	7.9V	8	NC
2	5V	9	5V
3	0V	10	0V
4	7.9V	11	7.9V
5	0V	12	0V
6	5V	13	5V
7	0V	14	0V

IC501

1	NC	17	NC	33	0V	49	0V
2	NC	18	0V	34	5V	50	5V
3	NC	19	NC	35	5V	51	0V
4	NC	20	NC	36	5V	52	5V
5	NC	21	NC	37	5V	53	5V
6	0V	22	4.8V	38	5V	54	0V
7	5V	23	0V	39	0.1V	55	5V
8	NC	24	0V	40	5V	56	5V
9	0V	25	0V	41	2.5V	57	4.8V
10	5V	26	0V	42	2.5V	58	NC
11	4.8V	27	NC	43	0V	59	4.9V
12	1.7V	28	5V	44	NC	60	NC
13	5V	29	5V	45	0V	61	1.5V
14	5V	30	5V	46	0V	62	NC
15	5V	31	5V	47	1.7V	63	NC
16	5V	32	0V	48	3.2V	64	NC

	E	C	B		E	C	B
Q101	13.3V	-0.3V	13.2V	Q506	0V	0V	0.6V
Q103	4.6V	1.9V	4V	Q507	13.1V	5V	12.4V
Q105	0V	13.2V	0V	Q508	7.9V	5V	7.3V
Q211	0V	0V	-0.3V	Q509	5V	5V	0V
Q212	0V	0V	-0.3V	Q510	0V	0V	5V
Q501	0V	8.2V	1.5V	Q511	5V	12.4V	5.6V
Q502	0V	5V	1.2V	Q802	7.9V	13.3V	8.5V
Q503	5V	1.2V	5V	Q803	0V	0V	5V
Q505	5V	5V	0V	Q804	13.3V	13.1V	0V

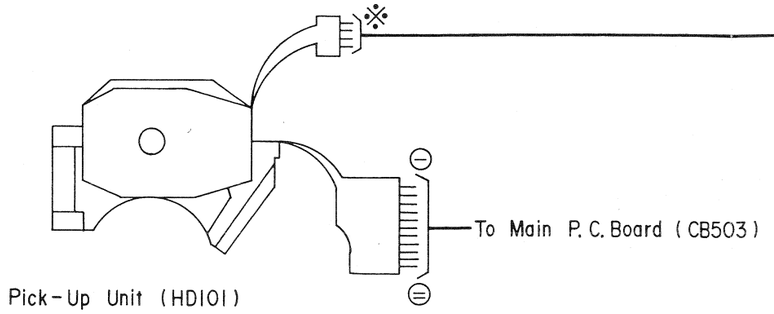
Measuring Conditions

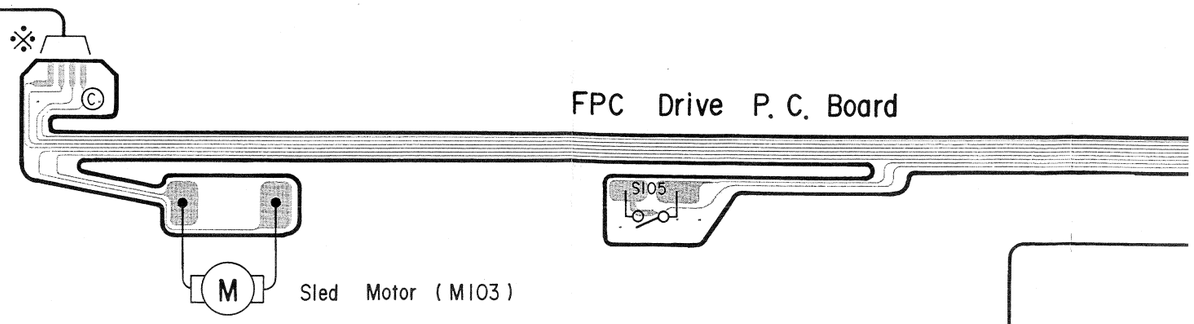
1. Power Supply Voltage : DC14V
2. Measuring Meter : Digital Multi Meter
3. Measuring Reference Point : Between Ground
4. Measuring Condition : Test Disc Play (A-BEX TCD-782 Track No.2 1kHz)

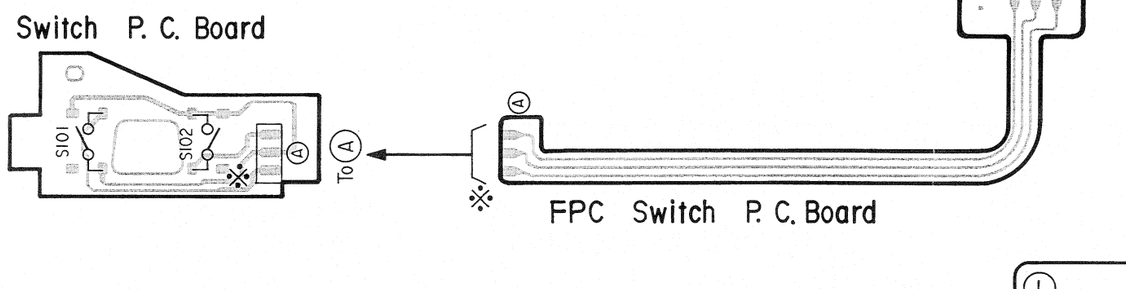
5960 5960

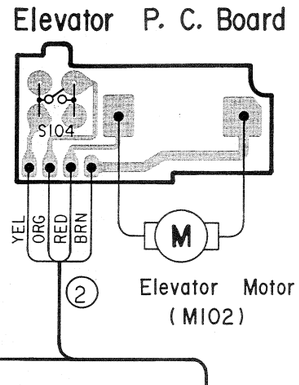
Parts Layout on P.C. Boards and Wiring Diagram

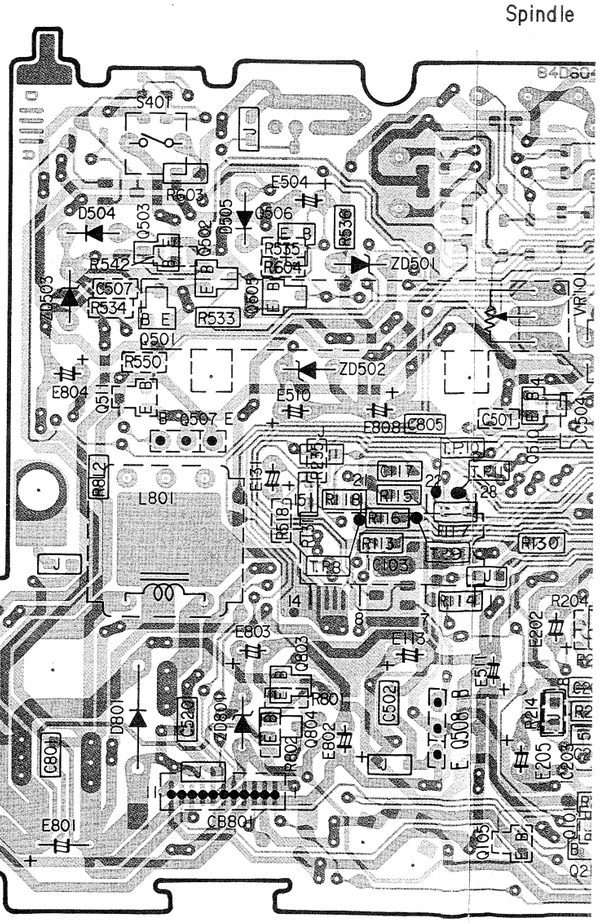
All P.C. Boards viewed from soldered side.

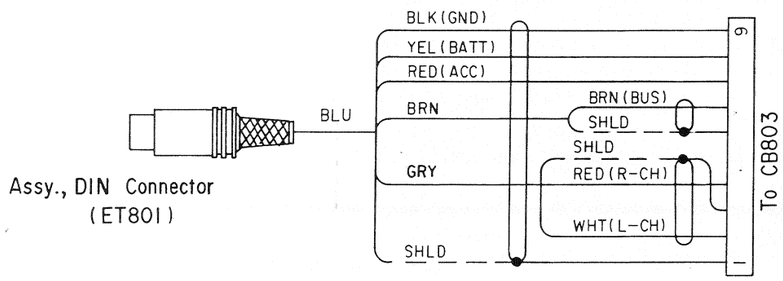


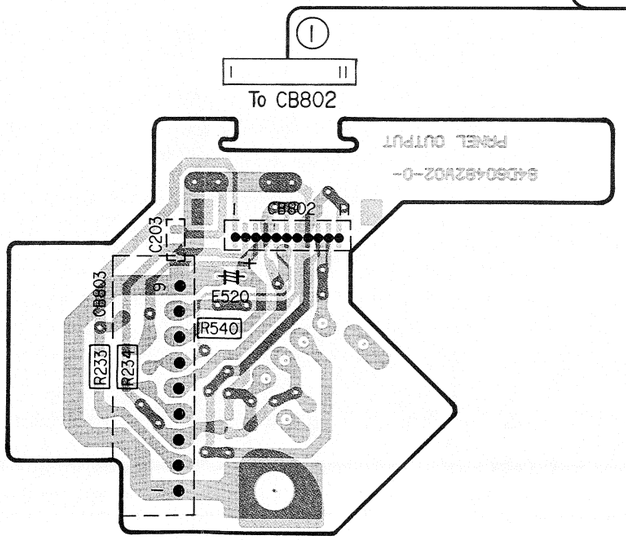






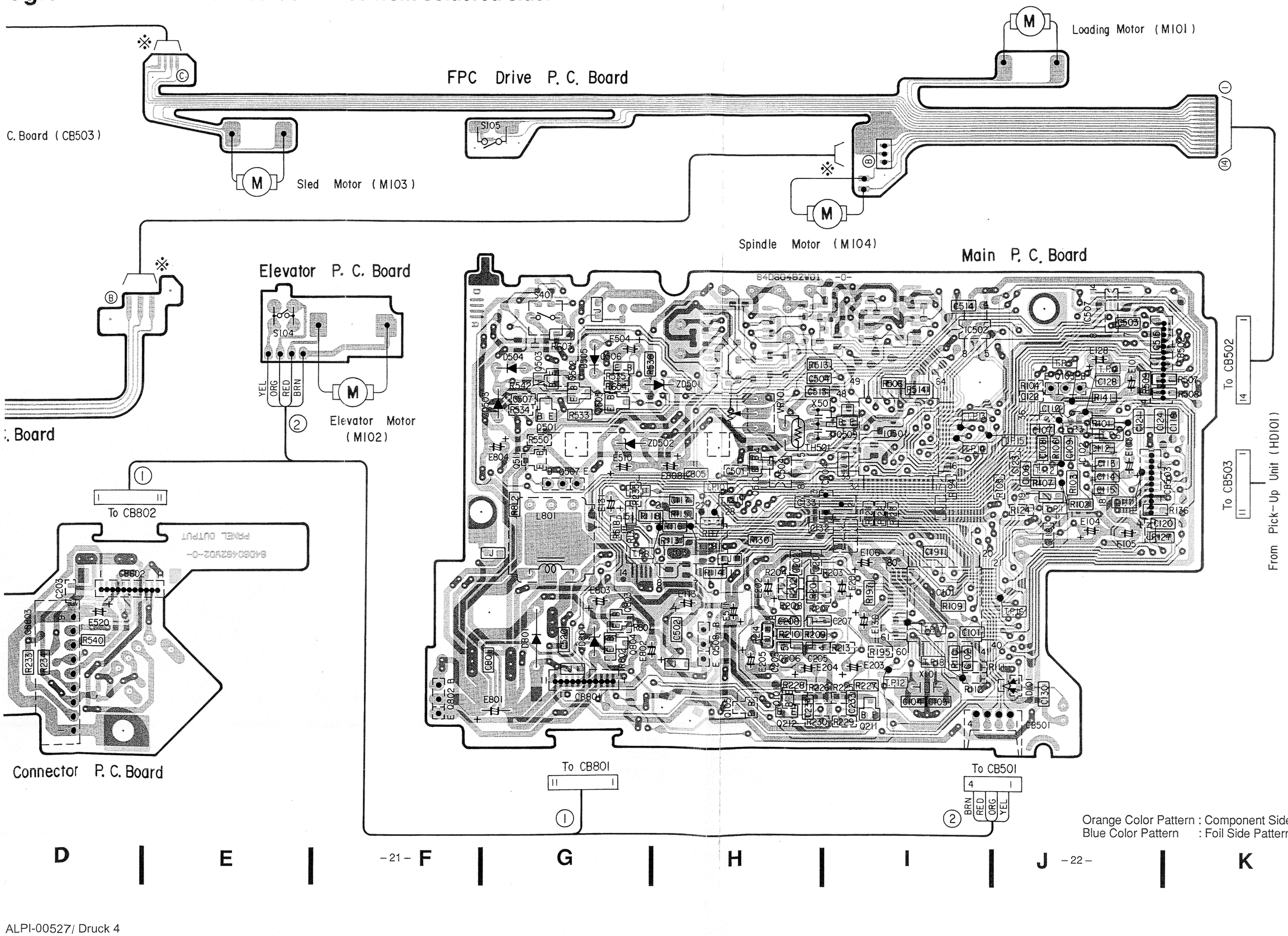






iagram

All P.C. Boards viewed from soldered side.



Orange Color Pattern : Component Side Pattern
Blue Color Pattern : Foil Side Pattern

D E -21- F G H I J -22- K

Electrical Parts List

Resistor : Carbon resistors under 1 / 4 watts are not mentioned in the parts list, please confirm them by schematic diagram.

Capacitor : μF = microfarads, pF = picofarads

Abbreviations

RES.=	Resistor	CAP.=	Capacitor
C.F.=	Carbon Film	ELY.=	Electrolytic
M.F.=	Metal Film	CER.=	Ceramic
M.O.=	Metal Oxide Film	MYL.=	Mylar
M.P.=	Metal Plate	TAN.=	Tantalum
TR.=	Transistor	POLY.=	Polystyrol
TRANS.=	Transformer	PP.=	Polypropylene
CP.=	Chip	PLT.=	Polyethylene
		PF.=	Polyester Film

Main P. C. Board

IC's

Symbol No.	Part No.	Description
IC101	51T65088W01	MN66271
IC102	51T65089W01	AN8803SB
IC103	51T65291W01	BA6790FP
IC104	51T92806F01	NJM78L05UA
IC203	51T16025W01	NJM2100M
IC501	51T45552W24	4552W24
IC502	51T45522W02	X24LC01SI
IC504	51T35308W01	M62007FP
IC507	51T45571W02	LB1836M

Transistors

Symbol No.	Part No.	Description
Q101	48T62966F01	CP., DTA143
Q103	48T84234F03	2SB1238
Q105	48T62967F03	CP., DTC124K
or	48T64222F02	CP., UN2212
Q211	48T63788F01	CP., 2SD1328
Q212	48T63788F01	CP., 2SD1328
Q501	48T62967F03	CP., DTC124K
or	48T64222F02	CP., UN2212
Q502	48T62967F04	CP., DTC144K
or	48T64222F03	CP., UN2213
Q503	48T62966F04	CP., DTA144
or	48T64221F03	CP., UN2113
Q505	48T62966F01	CP., DTA143
Q506	48T63417F01	CP., 2SC2412K
Q507	48T84234F03	2SB1238
Q508	48T84234F03	2SB1238
Q509	48T62966F01	CP., DTA143
Q510	48T62967F03	CP., DTC124K
or	48T64222F02	CP., UN2212
Q511	48T63417F01	CP., 2SC2412K
Q802	48T65256W03	2SD2136
Q803	48T62967F03	CP., DTC124K
or	48T64222F02	CP., UN2212
Q804	48T62966F01	CP., DTA143

Diodes

Symbol No.	Part No.	Description
D101	48T25651W02	MA152WK
D504	48T68828F11	1SS133
D505	48T68828F11	1SS133
D801	48T81044F01	10E2
ZD501	48T25766W03	Zener, HZS6A3L
ZD502	48T25766W03	Zener, HZS6A3L
ZD503	48T25766W20	Zener, HZS9A2L
ZD801	48T25766W20	Zener, HZS9A2L

Coil

Symbol No.	Part No.	Description
L801	24T65097W01	Choke

Crystals

Symbol No.	Part No.	Description
X101	91T25806W92	16.9344MHz
X501	91T15285W01	CER., Lock 4.19MHz

Switch / Thermistor

Symbol No.	Part No.	Description
S401	40T55182W03	Tact, SKHVBB (EJECT)
TH501	48T93439F06	Thermistor, 100K ohm

Capacitors

Symbol No.	Part No.	Description	
C101	08T15399W01	CP.,	0.022μF
E101	23S61523F07	ELY.,	47μF / 6.3V
C102	08T15399W01	CP.,	0.022μF
C103	08S65128F15	CP.,	15pF
E103	23S61523F29	ELY.,	1μF / 50V
C104	08S65128F15	CP.,	15pF
E104	23T74437F11	TAN.,	10μF / 6.3V
E105	23T74437F21	TAN.,	10μF / 10V
C106	08S65128F57	CP.,	1000pF
E106	23T74437F49	TAN.,	1μF / 35V
C107	08T15399W03	CP.,	0.047μF
C108	08T35374W01	CP.,	0.1μF
C109	08T35374W01	CP.,	0.1μF
C110	08T35374W01	CP.,	0.1μF
C111	08S65128F53	CP.,	560pF
C112	08S65128F35	CP.,	100pF
C113	08T15399W04	CP.,	0.027μF

Symbol No.	Part No.	Description
E113	23S61523F34	ELY., 100μF / 10V
C114	08S65128F65	CP., 4700pF
C115	08S65128F61	CP., 2200pF
C117	08S65128F68	CP., 8200pF
C118	08T15399W04	CP., 0.027μF
C119	08T35374W01	CP., 0.1μF
C120	08S65128F69	CP., 0.01μF
C121	08T35374W01	CP., 0.1μF
C122	08S65128F49	CP., 390pF
C123	08S65128F27	CP., 47pF
C124	08T35374W01	CP., 0.1μF
C128	08S65128F69	CP., 0.01μF
E128	23T74437F30	TAN., 4.7μF / 16V
C130	08T35374W01	CP., 0.1μF
E130	23T55402W09	ELY., 330μF / 6.3V
E131	23S61523F30	ELY., 2.2μF / 50V
C132	08T35374W01	CP., 0.1μF
C133	08T35374W01	CP., 0.1μF
C191	08T15399W03	CP., 0.047μF
C201	08S65128F47	CP., 330pF
E201	23S61523F05	ELY., 22μF / 6.3V
C202	08S65128F47	CP., 330pF
E202	23S61523F05	ELY., 22μF / 6.3V
E203	23T55402W15	ELY., 10μF / 16V
E204	23T55402W15	ELY., 10μF / 16V
C205	08S65128F45	CP., 270pF
E205	23T55402W13	ELY., 100μF / 10V
C206	08S65128F45	CP., 270pF
C207	08S65128F56	CP., 820pF
C208	08S65128F56	CP., 820pF
C233	08S65128F67	CP., 6800pF
C234	08S65128F67	CP., 6800pF
C501	08T15399W03	CP., 0.047μF
C502	08S65128F69	CP., 0.01μF
C503	08T55487W02	CP., 0.22μF
C504	08S65128F76	CP., 0.1μF
E504	23S61523F29	ELY., 1μF / 50V
C507	08S65128F49	CP., 390pF
E510	23S61523F07	ELY., 47μF / 6.3V
E511	23S61523F34	ELY., 100μF / 10V
C513	08S65128F35	CP., 100pF
C514	08S65128F69	CP., 0.01μF
C515	08T55487W02	CP., 0.22μF
C520	08T55401W01	CP., 1000pF
C801	08T15399W01	CP., 0.022μF
E801	23T55360W24	ELY., 470μF / 16V
E802	23S16086W01	ELY., 220μF / 10V
E803	23T55402W16	ELY., 22μF / 16V
E804	23S61523F15	ELY., 47μF / 16V
C805	08S65128F76	CP., 0.1μF
E808	23S16086W01	ELY., 220μF / 10V

Symbol No.	Part No.	Description
Resistors (All resistors are chip 1/10W±5% unless otherwise noted.)		
R101	06S64995F75	8.2K ohm
R102	06S64996F10	220K ohm
R103	06S64996F02	100K ohm
R104	06S64995F85	22K ohm
R105	06S64995F91	39K ohm
R106	06S64996F06	150K ohm
R107	06S64995F77	10K ohm
R109	06S64996F04	120K ohm
R110	06S64996F26	1M ohm
R111	06S64996F02	100K ohm
R112	06S64995F45	470 ohm
R113	06S64995F86	24K ohm
R114	06S64995F57	1.5K ohm
R115	06S64995F93	47K ohm
R116	06S64995F29	100 ohm
R117	06S64995F29	100 ohm
R118	06S64995F53	1K ohm
R121	06S64995F69	4.7K ohm
R122	06S64995F69	4.7K ohm
R123	06S64995F69	4.7K ohm
R124	06S64996F10	220K ohm
R127	06S64995F77	10K ohm
R130	06S64995F77	10K ohm
R131	06S64995F81	15K ohm
R136	06S64995F61	2.2K ohm
R141	06S70072F05	10 ohm 1/4W
R194	06S64995F77	10K ohm
R195	06S64995F77	10K ohm
R197	06S64995F27	82 ohm
R201	06S64995F63	2.7K ohm
R202	06S64995F63	2.7K ohm
R203	06S64995F73	6.8K ohm
R204	06S64995F73	6.8K ohm
R207	06S64995F69	4.7K ohm
R208	06S64995F69	4.7K ohm
R209	06S64995F81	15K ohm
R210	06S64995F81	15K ohm
R213	06S64995F50	750 ohm
R214	06S64995F50	750 ohm
R225	06S64995F86	24K ohm
R226	06S64995F86	24K ohm
R227	06S64995F21	47 ohm
R228	06S64995F21	47 ohm
R229	06S64995F78	11K ohm
R230	06S64995F78	11K ohm
R235	06S64995F79	12K ohm
R506	06S64995F93	47K ohm
R507	06S64995F93	47K ohm
R508	06S64995F93	47K ohm
R509	06S64995F93	47K ohm

Symbol No.	Part No.	Description
R513	06S64995F92	43K ohm
R514	06S64995F77	10K ohm
R518	06S64995F79	12K ohm
R533	06S64995F85	22K ohm
R534	06S64995F85	22K ohm
R535	06S64995F77	10K ohm
R536	06S64995F93	47K ohm
R542	06S70072F37	220 ohm 1/4W
R550	06S64995F85	22K ohm
R603	06S64995F93	47K ohm
R604	06S64995F93	47K ohm
R801	06S70072F34	160 ohm 1/4W
R802	06S70072F34	160 ohm 1/4W
R812	06S70072F38	240 ohm 1/4W
Connector P. C. Board		
Capacitors		
C203	08S65128F35	CP., 100pF
E520	23S61523F25	ELY., 0.1μF / 50V
Resistors (All resistors are chip 1/4W±5% unless otherwise noted.)		
R233	06S70072F05	10 ohm
R234	06S70072F05	10 ohm
R540	06S70072F45	470 ohm
Miscellaneous		
ET801	01T65051W01	DIN Connector
HD101	88T55261W01	Pick-Up Unit
M101	59T65085W01	Motor, Load 7V-370mV (LOADING)
M102	59T65085W01	Motor, Load 7V-370mV (ELEVATOR)
M103	59T65085W01	Motor, Load 7V-370mV (SLED)
M104	59T91005F03	Motor, Spindle 2V-215mA (SPINDLE)
S101	40T35543W02	Switch, Detector (UNLOAD)
S102	40T35543W02	Switch, Detector (LOADING)
S104	40T15222W01	Switch, Detector (MAGAZINE IN)
S105	40T71025F01	Switch, Detector (LIMIT)
VR101	18T55678W01	Volume, Slide RS32111 10K ohm

Symbol No.	Part No.	Description

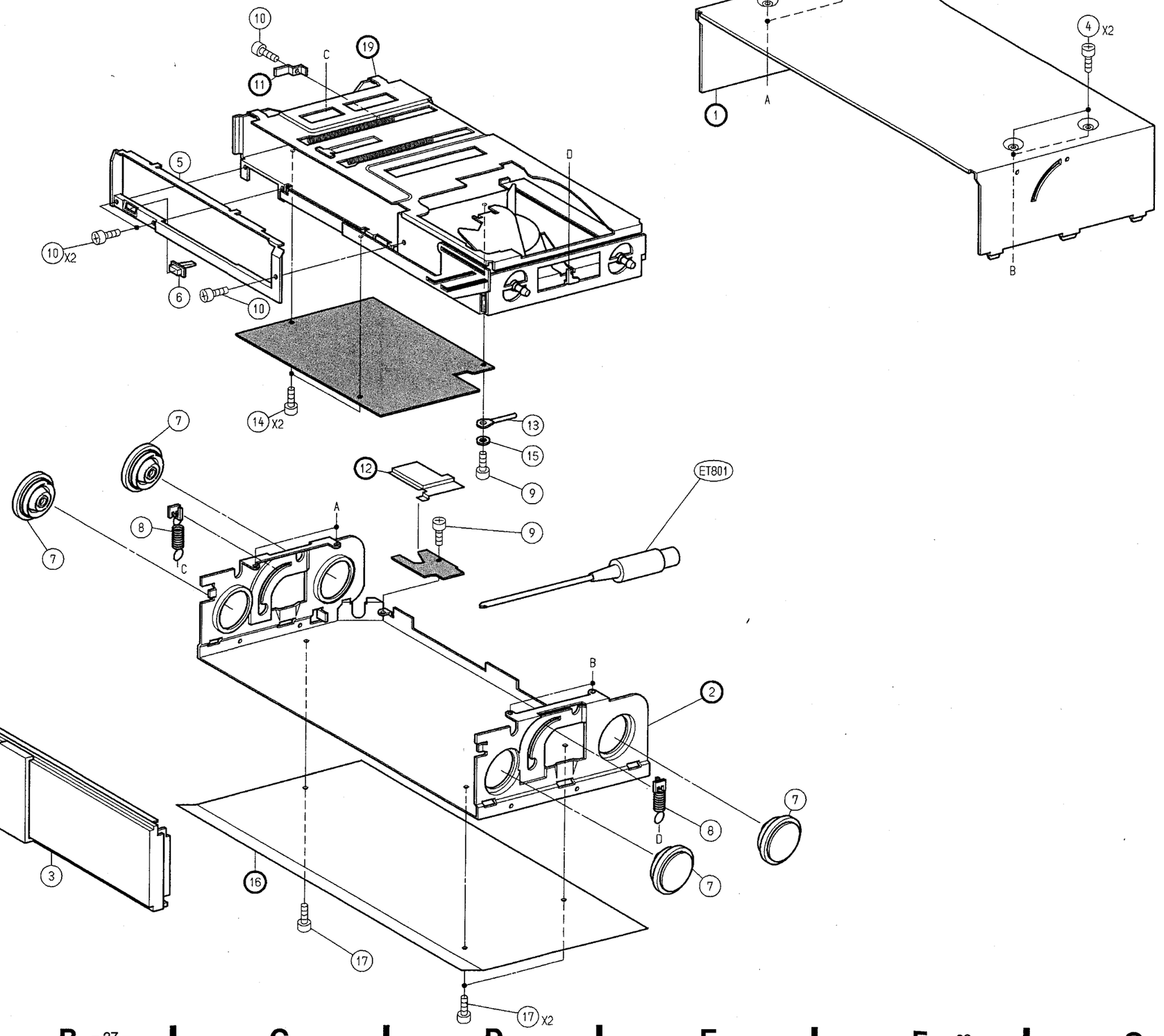
Cabinet Assembly Parts List

Note : No parts number on parts list are not supplied.

Symbol No.	Index	Part No.	Description
3	5-B	13C60207W01	Assy., Front Escutcheon
4		03A61184W01	Screw, Bind (M2.6×4)
5	2-C	64C60212W01	Plate, Inner
6	2-C	36A60213W01	Knob, Eject
7		75C58094W01	Damper, DT
8		07A61053W01	Assy., Bracket Spring
9	3-D	03S44205G62	Screw, Bind (M2.6×5)
10		03S94385F48	Screw, Pan (M2×4)
13	3-D	29C41045P02	Lug, Wrap Around
14	3-C	03A38056W01	Screw, Special (M2.6×6)
15	3-D	04S40070G51	Washer, Flat (M3)
17		03A68008W01	Screw, Transport (M3×12.2)

Symbol No.	Index	Part No.	Description

Exploded View (Cabinet)

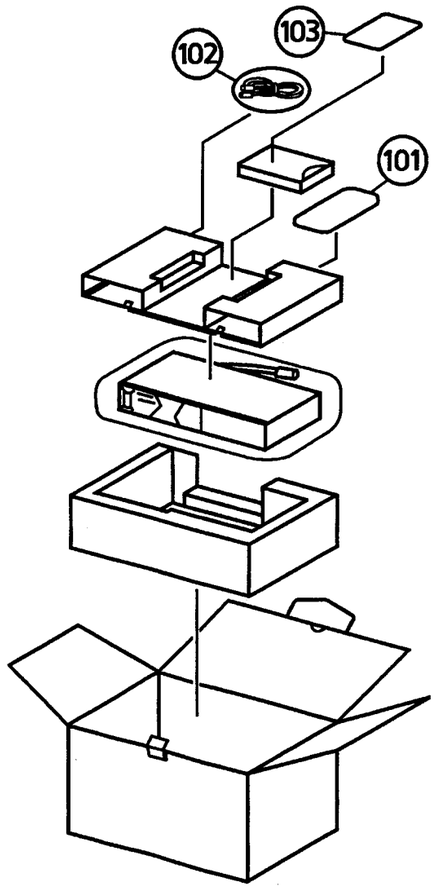


Packing Assembly Parts List

Symbol No.	Part No.	Description
101-1	03D40121T11	Screw, W/Doublu Washer (M4×8)
101-2	02B47353F06	Nut, Hex. (M6)
101-3	03B90962F03	Bolt, Hex. Flange (M6×50)
101-4	03S63857F05	Screw, Tapping (M5)
101-5	01B60343W01	Assy., Bracket
101-6	03B40155F10	Bolt, Hex. (M6×25)
102	01T45150W03	Assy., DIN Connector
or	01T45225W08	Assy., DIN Connector
103	68P60141W08	Owner's Manual

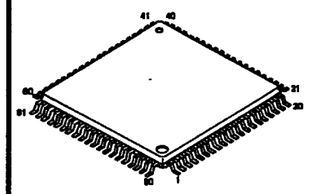
Symbol No.	Part No.	Description

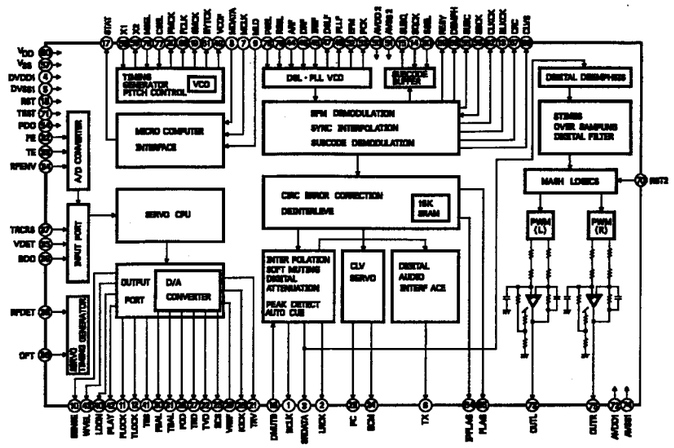
Packing Method View



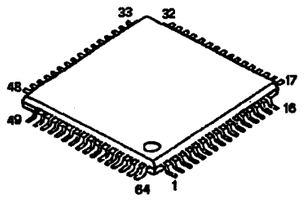
Semi - Conductor Lead Identifications

MN66271 : IC101





45552W24 : IC501



PIN NO.	CODE ADDRESS	I/O	PIN NO.	CODE ADDRESS	I/O	PIN NO.	CODE ADDRESS	I/O
1	NC	—	23	TLOCK	I	45	NC	—
2	NC	—	24	GND	—	46	GND	—
3	NC	—	25	FLOCK	I	47	LPS	I
4	NC	—	26	SENSE	I	48	TEMP	I
5	NC	—	27	NC	—	49	DOSW	I
6	SCL	I/O	28	MLD	O	50	ULDSW	I
7	SDA	I/O	29	M DATA	O	51	LODSW	I
8	NC	—	30	MCLK	O	52	MAGSW	I
9	GND	—	31	XRST	O	53	LMTSW	I
10	A0	O	32	D MUTE	O	54	EJKEY	I
11	A1	O	33	A MUTE	O	55	+5V	—
12	A2	O	34	V CONT	O	56	+5V	—
13	ELVM +	O	35	RST	I	57	SUBQ	I
14	ELVM −	O	36	BI	I	58	NC	—
15	LODM +	O	37	BATT	I	59	SQCK	O
16	LODM −	O	38	ACC	I	60	NC	—
17	EJLED	O	39	BLKCK	I	61	BUS OUT	O
18	TMPSW	I	40	+5V	—	62	NC	—
19	NC	—	41	X2	—	63	NC	—
20	NC	—	42	X1	—	64	NC	—
21	NC	—	43	IC	—			
22	STAT	I	44	NC	—			

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